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MEETINGS OF STATE PHARMACEUTICAL ASSOCIATIONS.

STATE.	TIME.	PLACE.	LOCAL SECRETARY.
Michigan,	Oct. 11,	Grand Rapids,	
New Hampshire,	Sept.,	Concord,	
North Carolina,	August 11,	Fayetteville,	B. E. Ledbury.
Wisconsin,	August 10,	Fond du Lac,	F. M. Givings.

THE AMERICAN

JOURNAL OF PHARMACY.

JULY, 1886.

ON THE BITTER PRINCIPLE OF THE AMERICAN CRANBERRY (VACCINIUM MACROCARPON, *LIN.*)

By Edo Claassen.

The existence of arbutin in the cowberry (*Vaccinium Vitis Idæa, Lin.*) was announced by me in No. 7, vol. 57, of this Journal. On account of this fact it was thought to be not only possible but probable, that the same principle would also exist in the American cranberry, a plant in botanical respect similar to the first-named (although not belonging to the same sub-genus, to *Vitis Idæa, Tourn.*, but to the subgenus *Oxycoccos, Tourn.*). This supposition seemed to be corroborated by the bitter taste of the fruit and by the blue colored liquid, which an extract of it gave with phosphomolybdic acid and ammonia (a reaction, said in No. 5, vol. 43, of this Journal, to be peculiar to and indicating the presence of arbutin). Although I had failed already once (see No. 7, vol. 57, of this Journal) to find arbutin in the berries, I undertook again the work and the trial, to separate arbutin from the branches and leaves of this shrub as well as also from the berries, in order to get at least, if no arbutin should be found, a clear idea and an exact knowledge of the nature of the bitter principle in it.

As the cranberry does not grow in this vicinity, Professor John M. Maisch was kind enough to furnish me about 8 pounds of the dry shrub, a quantity more than sufficient to make the necessary investigation. With the intention to also ascertain at the same time the presence in it of kinic acid, I divided the whole quantity received into two parts and subjected them to the following experiments:

Experiment 1.—One portion of the branches and leaves was boiled with water for half an hour; the liquid was separated by straining through a cloth, then somewhat concentrated by evaporation, acidulated with acetic acid, precipitated with neutral lead acetate, the liquid

separated by means of a filter and then mixed with lead subacetate, carefully avoiding an excess of it. The precipitate was collected on a filter, washed several times with cold water and *preserved for further examination in regard to the presence in it of kinic acid;* but the filtrate was saturated with sulphuretted hydrogen gas for the purpose of removing from it all the lead. After having separated the precipitate formed by a filter, the clear bitter liquid was evaporated to a thin syrup and set aside in a cool place for crystallization. The result will be found below.

Experiment 2.—The other portion was boiled for half an hour with water under addition of a sufficient quantity of quicklime, enough to give the liquid a strongly alkaline reaction; it was then strained, acidulated with acetic acid and precipitated with neutral lead acetate. After having removed the lead precipitate, the liquid was treated with sulphuretted hydrogen gas and after filtration evaporated to a syrup. The syrup was by and by mixed under almost continuous shaking with alcohol of 0·820 spec. grav., enough to remove from the liquid all the parts insoluble in the same. *This precipitate containing all the kinic acid, if present, in form of calcium kinate, was preserved for further trials;* but the liquid was subjected to distillation to recover the alcohol, the residue evaporated to a thin syrup, and put aside in a cool place for several weeks, so that crystals might make their appearance. As, however, no crystals were found at the end of that time in the syrup, it was diluted with water, precipitated with lead subacetate, filtered, the filtrate treated with sulphuretted hydrogen gas, the liquid obtained after filtration evaporated to a thin syrup and again set aside in a cool place for several weeks. But, like before, no crystals were formed. The same was the case with the syrup-like liquid in experiment 1. Both were, therefore, poured into one bottle and for further purification repeatedly treated with a mixture of 1 part of alcohol of 0·820 spec. grav. and of 3 parts of officinal ether of 0·750 spec. grav. The solution obtained was subjected to distillation and the syrup-like residue again put down for crystallization; even after the lapse of several weeks also this liquid did not show any tendency to crystallize, as did not too the bitter liquid left in the bottle after the treatment with the above solvents, which, as may be mentioned, seemed to be impurer than the dissolved portion.

The bitter principle thus obtained cannot evidently be regarded, although considerable care was taken in preparing it, as the principle in

its purest state. The result of testing it and its solution with reagents was the following :

1. Chlorhydric acid dissolved the same without change of color; but soon the liquid turned somewhat darker and got turbid under evolution of a strong peculiar smell.

2. Nitric acid dissolved it with light orange color.

3. Sulphuric acid dissolved it with brown color, which turned soon darker and got nearly black under separation of coal.

4. Boiled with very dilute sulphuric acid, the liquid showed very soon a turbid appearance, evolving at the same time a strong, peculiar smell; a resin-like mass was seen suspended in the now clear liquid after a continuation of the boiling for several minutes.

5 An alkaline copper solution, heated with the solution to the boiling point, showed hardly any change of color and *not the smallest trace* of a deposit of copper protoxide.

6. The liquid obtained under 4 after the treatment with dilute sulphuric acid, furnished, when heated with an alkaline copper solution, a copious precipitate of copper protoxide.

7. A very dilute iron sesquichloride-solution did not produce any perceptible change of color.

8. Ammonia and phosphomolybdic acid-solution turned the solution of the bitter principle blue like that of arbutin; the blue color disappeared also by and by.

9. Neutral lead acetate, lead subacetate, lead subacetate and alcohol (which precipitate ericolin), platinum chloride, potassium iodide, iodine and potassium iodide, gallic and tannic acids did not give any precipitates. Mercury bichloride caused a little turbidity, which by heating the liquid increased somewhat and settled down in yellowish brown flocks. Silver nitrate effected also a hardly visible turbidity, which remained the same when the liquid was heated to the boiling point; but by continued boiling the liquid soon turned brown, growing by and by darker, and then gave a copious brownish black deposit of silver.

Having failed thus far, to find a crystallizable principle in the leaves etc., two more experiments were made with the berries:

Experiment 3.—Several pounds of the nearly ripe berries (these having decidedly a more bitter taste than the ripe ones) were crushed, mixed with water and hydrated lead oxide enough to remove the acid taste, then pressed, the liquid filtered, saturated with sulphuretted hy-

drogen gas and after filtration evaporated to the consistency of a thin syrup, in which, however, no crystals were formed even after two weeks' standing.

Experiment 4.—Several pounds of the not quite ripe berries were crushed and macerated with water until the whole presented itself as a reddish mass; it was then pressed, the liquid precipitated with lead subacetate and this mixture evaporated on the water bath to the consistency of a thin extract, which was repeatedly treated with hot alcohol. The alcoholic liquid was distilled and the residue left in the flask, as it gave yet a precipitate with lead subacetate, was treated with this reagent. After having removed the lead from the filtrate, the latter was evaporated to a thin syrup, which, however, did not furnish any crystals. The syrup-like liquids, obtained in 3 and 4, were then for further purification mixed, repeatedly extracted with a mixture of 1 part of alcohol of 0·820 spec. gravity and of 3 parts of officinal chloroform, the solution subjected to distillation and the residue dissolved in water. This solution possessed a sweetish bitter taste and reduced an alkaline copper solution, evidently proving that some of the glucose, contained in the berries, had entered the same; for further purification it was now treated with a mixture of 1 part of alcohol of 0·820 spec. grav. and of 3 parts of ether of 0·735 spec. grav.; but without the desired result, as the liquid remaining after the separation of the alcohol and ether did yet reduce an alkaline copper solution. As always before *no* crystallization took place in the properly condensed liquid. The bitter principle thus obtained from the berries, conducted itself equal to that prepared from the leaves *with the exception*, that it, as stated, reduced an alkaline copper solution, as also a silver nitrate solution, which latter too was due to the presence in it of glucose; the reduction of the copper solution was effected long before the boiling point was reached; the silver solution also was easily reduced as soon as the liquid began to boil, in which last case a slight mirror of silver was deposited on the glass, while a brownish black powder was suspended in the liquid. According to the above, the bitter principle of the cranberry can be prepared and obtained in a purer state more easily from the leaves etc., than from the berries.

The result of the above experiments and of a few other trials is, as may be said here in a few words, the following:

The American cranberry (*Vaccinium macrocarpon, Lin.*) contains in all parts a very bitter uncrystallizable principle, for which I would

propose the name *oxycoccin*. It represents a yellowish brown extract-like mass, which gives, when dried, a very hygroscopic powder of lighter brown color.

It dissolves easily in water and alcohol, very sparingly in ether and chloroform. When heated on platinum foil, it at first swells up considerably, evolving a strong, peculiar smell, then ignites with flame and is almost entirely consumed, leaving but little ashes (of an alkaline reaction), containing sodium and some potassium. Heated in a glass tube it is easily reduced to coal under evolution of a penetrating smell somewhat resembling that of tobacco juice. In its conduct towards reagents it resembles somewhat arbutin; like this substance, which, however, forms long needle-shaped crystals, it reduces, when heated for a short time with very diluted sulphuric acid, an alkaline copper solution; besides that it is giving a blue color with phosphomolybdic acid and ammonia, a reaction, which from now *cannot be used any more* for the detection of arbutin in a liquid, and the only value of which is consequently, that *by means of the same the absence*, but not the presence, of arbutin can be ascertained.

Of the above reactions the most interesting is that one, which shows that the bitter principle of the cranberry is converted by boiling with dilute acids into glucose and another perhaps yet unknown substance, and that, in consequence of this fact, it belongs to the glucosides.

Finally I may be allowed to mention in regard to the above obtained lead and calcium precipitates, that their examination was already commenced some time ago and that from them a calcium salt was obtained, forming beautiful four—or mostly six—sided plates, on the identity of which with calcium kinate the necessary tests will be made soon.

CLEVELAND, MAY, 1886.

Kava as a Local Anæsthetic.—Lewin (*Deutsche Medicinal-Zeitung*, Feb. 1, 1886) reports the results of additional personal experiments with this new narcotic, the anæsthetic properties of which are singularly like those of cocaine (see this JOURNAL, p. 138). He found that six or seven minims of a solution of kava, injected beneath the skin, produced complete loss of sensibility in the surrounding area, which did not pass off for five days. The anæsthesia was so extreme that even strong induced currents failed to produce more than a slight prickling sensation. When a small quantity of the resin was placed on the tip of the tongue the bitterest drug could not be tasted.—*N. Y. Med. Jour.*, May 8, 1886.

OFFICIAL PHARMACY.

By R. Rother.

When individual experiences find agreement at large the correspondent beliefs arising from this consensus of practice finally assume an authoritative form. Whilst, in the beginning, dissent, if merely passive is at least respected, the rule of custom at last generates a public opinion whose stringency exacts a rigid conformity. If, however, these demands eventually prove onerous under new conditions, or, if their fallacy becomes pronounced, a decided and powerful reaction does not fail to modify, if not wholly disregard, them. In aggregates not altogether despotically regulated, a unanimity of public assent is essential to coercion, as without its sanction legislative enactments can attain no permanent force. The unwritten law is, in the last resort, the one source from which all others emanate. Ignoring the voluminous and questionable body of laws having their origin in a sophistical legal system, there is yet remaining a sound codified legal nucleus at the base of social activity. Upon this fundament rest the various semi-legal codified authorities, designed to regulate the diverse ramifications of the industrial system of society.

After undergoing a variety of transformations, conventional methods finally attain the attributes of custom, if not the more definite authority of technical law. This would indicate that the practice of appropriate action in becoming organized and organic, persists independent of extraneous reinforcement, and thus precludes the supervision of authority. This would be true in a perfectly homogeneous system, but not in systems having components of all orders and degrees of correspondence. Furthermore, the most accomplished individuals are in no less need of an exemplary guide than the least accordant are of a coercive regimen. Thus, whilst the better adapted have a thorough comprehension of the exigencies at large and their own concordance with them, the general intricacy of the interactions renders an authorized guide most serviceable, even to them. Then, as regards the greater portion who are more or less deficient in these respects, the intervention of a technical authority becomes indispensable.

The Pharmacopœia is a semi-legal code whose authority is, however, at present chiefly based upon a generalized conventionality, rather than upon a prevalent custom, public opinion, or legal form. It thus shows itself to be in the incipient stage of progress. Under such

circumstances, its acceptability mainly rests on the intrinsic merits of its character. If it is clear, concise, practical and withall scientific—its field of usefulness and consequent authority will correspondingly expand and prevail. If it is hampered by uncongenial methods, forms and superfluities—its general recognition will suffer a commensurate retardation.

Much can be said in favor of the new Pharmacopœia. Its general arrangement is simply admirable. The introduction of chemical symbols is equally commendable. The retention of the old notation along-side the new is a feature whose force, however, is not apparent. Had this place been filled by the so-called constitutional expressions of the previously given empirical formulæ, the scientific and practical character of the work would not have suffered thereby in the least. The descriptive parts are not new, however, and, although bettered, still admit of great improvement. A new feature of a rather questionable nature has been introduced. This is, namely, an extension of the systematic part relative to biological Materia Medica. Heretofore, it was deemed all sufficient for the Pharmacopœia to indicate the necessary relationships of biological products, by simply referring them to species and genus. This now appears to be insufficient, and hence, also, order and class is given. If such exact discrimination is essential, it would appear that strict scientific accuracy demands a more particular proceeding than the one officially adopted. A description of this kind, in order to be of any value, requires the tracing of an unbroken line of the relations. A proper systematic arrangement must include, in regular gradation, not only the specifical and generical reference, but also the tribal, ordinal, cohortal, classal, etc. Also, in order to maintain its authority unchallenged the Pharmacopœia should forego acknowledged antiquated forms by promptly assenting to standard classification.

The Pharmacopœia contains nearly 250 separate items of systematic references. The class *Insecta* is composed of four very characteristic and distinct sub-classes. Three orders of Insects are officially cited, but the fact was omitted that they belong to the sub-class *Hexapoda.*

According to standard classification, there is no order Sturiones. The *Acipenseridæ,* or Sturgeons, constitute only a group or family of the order *Chondroganoidei,* sub-class *Ganoidei,* class *Pisces.*

There is no order Teleostia, as officially given under Oleum Mor-

rhuæ. The family *Gadidæ* are part of the order *Teleocephali*, sub-class *Teleostei*, class *Pisces*.

The *Gallinæ* are no order. Like the *Cracidæ* and *Columbæ*, they are merely one of the numerous groups of one of Huxley's four principal divisions of the order *Carinatæ*, class *Aves*.

The term Pachydermata is so antiquated and obsolete that it would be difficult to find, even in a public school text-book. In the Pachydermata, the *Proboscidea* were mixed up with artio and perissodactyl ungulates. The *Suidæ* are a family group of the Non-Ruminants of the sub-order *Artiodactyla*, order *Ungulata*, sub-class *Monodelphia*, class *Mammalia*.

The *Bovidæ* belong to the Ruminantia of the sub-order *Artiodactyla*, order *Ungulata*, sub-class *Monodelphia*, class *Mammalia*.

It appears like a somewhat remarkable distinction that in its references to the Animal Realm, the Pharmacopœia should use only the term order, whereas in connection with the Realm of Plants the designation Natural Order only occurs. The qualifying addition "Natural" is here wholly superfluous, since the distinctions are all manifestly based upon natural characters.

There is no order of Algæ, as the Pharmacopœia has it. The term Alga is not systematic. It is merely general, signifying an aquatic chlorophyllic thallophyte. Thallophyte is also but a conventional term having no systematic significance. It embraces plants contained within the first four Primary Divisions of the Vegetable Realm, namely, the *Protophyta*, *Zygosporeæ*, *Oosporeæ* and *Carposporeæ*. Thus, for instance, the greater part of the green algæ of ponds and streams belong to the primary division *Zygosporeæ*.

There is also no order of Fungi, as is officially given. The term Fungus is merely of general import, meaning a terrestrial chlorophylless thallophyte.

As may be readily inferred from what was previously said, thallophytes are not all thallus plants. Although the distinction between algæ and fungi is but a physiological one, depending upon the presence or absence of chlorophyll, no more are all chlorophylless plants fungi. Thus, for instance, the noted Bacteria are detached or clustered chlorophylless cells belonging to the order *Bacteriaceæ*, class *Schizomycetes*, pr. div. *Protophyta;* whereas, fungi are chiefly the higher grades of Thallophytes.

A somewhat similar but inverse confusion exists in regard to the

term mould. The order *Mucorini*, or Moulds, belongs to the class *Conjugatæ*, of the pr. div. *Zygosporeæ*, and is the only order of this division which contains no chlorophyll, although related by class limits to the unicellular algæ, composing the orders *Desmidiaceæ* and the wonderful *Diatomaceæ*. Now the so-called common blue mould, *Penicillium glaucum*, is not a mould, but a saprophytic fungus of the order *Tuberaceæ*, class *Ascomycetes*, pr. div. *Carposporeæ*. The primitive plants called Slime Moulds are otherwise the class *Myxomycetes*, pr. div. *Protophyta*.

The official species belonging to the genus *Chondrus* are marine algæ of the order *Gigartineæ*, class *Florideæ*, pr. div. *Carposporeæ*.

The fungus of Ergot belongs to the order *Pyrenomycetes*, class *Ascomycetes*, pr. div. *Carposporeæ*.

The fungus *Ustilago Maydis*, or corn smut subsists parasitically in the tissues and chiefly the ovary of *Zea Mais*, and belongs to the order *Ustilagineæ*, class *Ascomycetes*, pr. div. *Carposporeæ*.

The Phanerogamia, or floral plants, compose the two classes of *Gymnospermæ* and *Angiospermæ*. The latter also contains two sub-classes, the *Monocotyledones* and the *Dicotyledones*, divided into numerous cohorts.

In the Animal Realm the Pharmacopœia extended its classification as far as classes, but in the Realm of Plants it does not go beyond orders. The force of such discrimination is not apparent.

It appears that the orders Melanthaceæ and Smilaceæ of the Pharmacopœia have no existence, but colchicum, sarsaparilla, cevadilla and veratrum belong to the order *Liliaceæ*.

There is no order Zingiberaceæ, but there is a sub-order *Zingiberæ*, order *Scitamineæ*, cohort *Amomales*.

The chestnut and oak are in the sub-order *Quercineæ*, order *Cupuliferæ*.

The elms belong to the order *Ulmaceæ* of the cohort *Urticales*, and not, as officially stated, to the order *Urticaceæ*. As the latter contains no sub-orders, consequently Ulmeæ has no existence.

For this reason there is, also, no sub-order Cannabineæ; but hemp and hop are of the order *Cannabineæ*, cohort *Urticales*.

For the same reason there is, also, no sub-order Artocarpeæ; but fig belongs to the order *Moraceæ*, cohort *Urticales*.

Storax is of the order *Styracaceæ*, and not of *Hamamelaceæ*, as referred officially.

Uva-ursi and gaultheria are in the sub-order *Ericineæ*, and chimaphila in the sub-order *Pyrolineæ*, both of the order *Ericaceæ*.

Rubiaceæ contains no sub-orders and, consequently, the official Cinchoneæ and Coffeæ do not exist.

There are no sub-orders in *Umbelliferæ*, and therefore, the Orthospermæ, Coelospermæ, and Campylospermæ have no existence.

Pomegranate is in the order *Lythraceæ*, and hence Granataceæ is unknown.

Hamamelaceæ has no sub-orders, and so Balsamifluæ is unreal.

Rosaceæ presents no sub-orders, as indicated in the Pharmacopœia, but it is possessed of ten tribes. Quince belongs to the tribe *Pomeæ*, the roses to *Roseæ*, Rubus to *Rubeæ*, Quillaia to *Quillajeæ*, and the almond, prune and wild cherry to *Pruneæ*.

Officially, the sub-orders of *Leguminosæ* are somewhat confused. The genera *Copaifera* and *Hæmatoxylon* properly belong to the sub-order *Cæsalpinieæ*, and not, as according to the Pharmacopœia, to *Papilionaceæ*.

Rhus and mastic must be referred to the order *Anacardiaceæ*, the official order Terebinthaceæ being unknown.

Guarana is in the sub-order *Sapindeæ*, order *Sapindaceæ*.

There is no order Aquifoliaceæ. Prinos belongs to the order *Ilicineæ*.

Rutaceæ has no sub-orders, but seven tribes. Orange, lemon and bergamot belong to the tribe *Aurantieæ*, prickly ash to *Xanthoxyleæ*, buchu to *Diosmeæ*, and rue to *Ruteæ*. There is no order Aurantiaceæ.

No such order as Erythroxylaceæ seems to exist, but Erythroxylon is found in the order *Linaceæ*.

As there are no sub-orders in *Cruciferæ*, it is evident that the sub-order Siliquosæ is fictitious.

From the practical stand-point of pharmacy, the utility of this extensive classification is not apparent. In illustration of this, a glance at the order *Leguminosæ* will suffice. Furthermore, it can aid very little, but rather confuse, in the identification of biological products listed in Materia Medica. For purposes of identification and guide in reference to quality, the more specific and individual characters require scrutiny, and for such purposes much more ample and effective measures are known.

CAOUTCHOUC IN BENZOIN.

By Charles Schmidt.

Ten ounces Sumatra benzoin were reduced to No. 20 powder and macerated for seven days with an equal weight of alcohol. The resulting tincture was filtered. On examining the dregs on the filter, which seemed to consist chiefly of bark, the writer noticed a whitish substance running through the dregs in fine veins, just below the surface. Upon taking hold of a vein it was found to be elastic. This substance was easily separated from the dregs, and washed with alcohol and water. Slight pressure between the fingers caused it to form into a mass very much resembling caoutchouc. It was forwarded to Prof. Power, of the University of Wisconsin, who kindly examined it and determined it to be really caoutchouc.

The writer procured a second sample of Sumatra benzoin from another lot, but failed to find caoutchouc in it by the above simple process. In this second operation, the dregs remaining in the filter were dried and shaken with carbon disulphide. The clear liquid was poured off and evaporated spontaneously, leaving a light yellow residue. The portion insoluble in carbon disulphide, was shaken with chloroform and the clear solution poured off and evaporated spontaneously, leaving a light brown residue. Both these residues were examined at the John Hopkins' University, through the kindness of Prof. Remsen, but no caoutchouc was discovered in either of them.

This would seem to indicate that the caoutchouc in the first specimen was an accidental impurity and not a natural constituent of benzoin, as was at first supposed by the writer.

Baltimore, June, 1886.

ON SOME PHARMACOPŒIAL SYRUPS.

Abstracts from Theses.

Syrupus Ipecacuanhæ.—On mixing fluid extract of ipecac, prepared strictly in accordance with the present pharmacopœia, with simple syrup, a slight amount of flocculent matter will separate and float in the syrup. Fred. Dunn, Ph.G, observed that the addition of a few drops of ammonia water will prevent the separation; but, it is preferable to mix the fluid extract with water, adding 8 drops of ammonia water for 1 ounce of fluid extract, and percolating this mixture through the requisite quantity of sugar. The resulting

syrup is transparent, of a brown color, and quite efficacious. Some commercial fluid extracts of ipecac required a larger quantity of ammonia to furnish a transparent syrup.

Syrupus Lactucarii.—The present process is complicated and tedious, and requires close attention to the details. Wm. A. McBath, Ph.G., prefers the process recommended by J. L. Lemberger (see Amer. Jour. Phar., 1878, p. 599). Benzin or ether dissolves from coarsely powdered lactucarium a little less than 50 per cent. of inert matter, which is almost tasteless, odorless and colorless, and may be taken in considerable quantity without producing any appreciable effect on the system; but, the two extracts differ somewhat in character. The ether extract is readily broken up in small pieces, and does not stick together unless heated, while the benzin extract is of a soft, waxy consistence, and adheres together in a mass. The lactucarium exhausted by either benzin or ether is treated with diluted alcohol, the tincture evaporated and, with the addition of sugar, converted into syrup.

Syrupus Rhei.—Arthur Berrett, Ph.G., suggests the preparation of this syrup from the fluid extract, and the substitution of oil of Ceylon cinnamon for cinnamon bark; the fluid extract, mixed with the oil, dissolves readily in water containing the potassium carbonate in solution, and, with sugar, is converted into a pleasant and efficient syrup.

Syrupus Rhei aromaticus.—A modification of the pharmacopœial formula is suggested by Edward C. Lafean, Ph.G., whereby the alcohol contained in the syrup is reduced to about one-half the quantity now directed. The modification consists in preparing an alcoholic tincture from the aromatics, and in treating the rhubarb, in powder No. 40, with a mixture of water 2 parts and glycerin 1 part, at a temperature of about 180° F. After straining the infusion and washing the dregs with water, the sugar is dissolved in the liquid, the hot syrup is filtered and, after cooling, thoroughly mixed with the tincture of aromatics. Thus prepared the syrup is transparent, does not precipitate and keeps well.

Syrupus Sarsaparillæ compositus.—With the view of simplifying the pharmacopœial process, and of avoiding evaporation and loss of alcohol, A. Berrett, Ph.G., proposes to use the oils of sassafras, gaultheria and anise in proper quantities in the place of the drugs. The mixed oils are first incorporated with the guaiacum wood, this mix-

ture, with the powdered liquorice root and senna, and, finally, the ground sarsaparilla, is added, followed by the rose petals. For the pharmacopœial quantities, 8 parts of ammonia water are used, of which 6 parts are added to 100 parts of a mixture composed of 1 volume of alcohol and 7 of water. After macerating the mixed powder for one or two days in this menstruum, the whole is transferred to a percolator, and displaced with a mixture of alcohol and water, as before, to the first 200 parts of which 2 parts of ammonia water have been added. The percolation is continued until 400 parts of liquid have been obtained, in which the sugar is dissolved without heat.

Syrupus Tolutanus.—A modification of the pharmacopœial formula is suggested by Silas J. Duffie, Ph.G., who proposes to digest at 80° C. for two hours 4 parts of tolu balsam in 30 parts of water, and to add, after cooling, 4 parts of alcohol; this mixture is strained through a well wetted muslin strainer, and this is washed with water until 35 parts of liquid have been passed, in which 65 parts of sugar are dissolved by percolation. This yields a handsome and permanent syrup, and the presence of the four parts of alcohol is not considered to be objectionable.

TINCTURE OF KINO.

By R. Rother.

The remarkable stability of the homogeneous which is *a priori* inferable is everywhere manifested in experience. Were it otherwise there could be no orderly coherence anywhere. The tendency of like units and groups to segregate is universal. Similar units and aggregates subjected to the same conditions must therefore give the same results, which latter will vary correspondingly as the conditions are changed. Hence a heterogeneous whole will necessarily be transformed into more coherent compacts of interrelated homogeneous groups. Both very simple and complex illustrations of this occur in chemistry. When under certain conditions a chemical reaction results, the product, although evidently more complex, is nevertheless more homogeneous under the new conditions than in the prior sphere. When the new body or bodies thus resulting are again sundered through the influence of light, heat, or other agency, the constituent elements may reappear in their simplest form. Whilst the new con-

ditions supervene the isolated elements following their native affinities are again homogeneously segregated. This shows that the immanent forces determine the states which persist relative to their degree of homogeneity. Hence changeability characterizes those conditions presenting stages tending to more stable adjustments. From this it is evident that the so-called chemical affinities are but secondary qualities, and that the tendency is rather towards a final isolation. The known properties of the chemical elements show them to possess interrelations independent of so-called chemism, indicating that ultimate segregation separates them into more and more related, that is, more and more similar and simpler forms.

The work of the higher agencies, although continually renewed, is ever suffering degradation. This extreme changeability is a characteristic of exceeding heterogeneity, and the conflict results from the selection of the relatively similar into more homogeneous groups. These adaptive actions or adjustments are therefore contingent upon heterogeneity, since the homogeneous presents no differences for selection to assimilate. This makes it manifest that the higher activities can only prevail in the correspondingly heterogeneous, and that an ultimate diversification into the most homogeneous precludes their existence.

Vital redistribution is dependent upon the highest order of unlikeness, and consequently many of its products are comparably intricate. A very active selection is therefore implied, although the groundwork of the various agencies involved is notably similar. It is only in the transitional stages, however, that this unwonted complication of products is found. In the final stages their simplicity and uniformity is equally noteworthy.

The products elaborated by plants, for instance when intercepted during the intermediate phases, constitute not only means of sustentation for other plants and chiefly animals in their normal states, but are importantly energetic in correcting or inducing various abnormal conditions. As segregated in the plant body, many vegetable products are confined to peculiar surroundings, whereby a native supply is maintained. When these substances are naturally merged, or where this occurs artificially, as in case of the galenical products of pharmacy, further reactions occur and ulterior changes take place.

Thus an aqueous or more or less alcoholic extract of an organic drug may at first possess a fastidious transparency. Very soon, how-

ever, in many instances, more or less voluminous precipitates form. These may in some cases be simply due to incapacity of the solvent employed. In others, to reactions among some of the extracted components. In yet others, to effects either of hydration or dehydration resulting from the menstruum. In still others, to changes undergone by the menstruum itself. Further, in others, by septic action, that is, alteration resulting from the original presence of a chemical ferment. Yet, further, in others, as brought about by some extraneous agent of zymotic character, whereby both medium and substance are degenerated. Still, further, in others, where light caused disturbances. And, in others, where atmospheric oxidation produced interferences of a radical nature, which may or may not be aided by light. Whether the carbonic anhydrate of the atmosphere exerts any action in such connection has not yet been ascertained.

The floeculent sediment formed in most fluid extracts and tinctures, although occupying considerable space when in suspension, is yet but trifling in amount and generally inert. It consists, in many instances, of inorganic salts usually tinted by adhering coloring matter. In some cases it is gummy, albuminous or pectinous in nature, and, if of the latter kind, may cause some inconvenience in subsequent filtration.

The deposits resulting from atmospheric oxidation are generally more abundant, and, in some cases, so profuse as to virtually solidify the preparation.

This occurs with tincture of kino as the writer has ascertained (New Remedies, July, 1879). The transformation in this particular instance is not strictly the production of a visible sediment but a gradual thickening of the liquid until wholly firm. Various expedients have been suggested to remedy this difficulty. The present official process employs glycerin, which, however, is as unsatisfactory as all other agents previously tried. The alleged occasional success with sundry corrigents can only be accounted for by the fact that there are numerous varieties of kino, and that one or the other sort may not be susceptible to this change. On the occasion above referred to, the writer advised the exclusion of air as an infallible protection. Results since then obtained have only tended to confirm the efficiency of this method. Some samples of tincture, prepared on the 6th of February, 1880, preserved in filled two-ounce vials, are at present in prime condition. It was previously observed that after some time the corks

become loosened through the contraction induced by the alcohol vapor as well as by changing temperature. In all such bottles the effect of air on the tincture became very manifest. In such that admitted much air gelatinization became complete. If, however, the precaution is taken to look after the corks and keep them fastened no deterioration results. When a vial was partially emptied the remainder invariably jellied in due time. The addition of glycerin before or after gelatinizing had no visible effect, either in preventing the alteration or regenerating the spoiled tincture. As some loss and inconvenience nevertheless results from this treatment, the writer concluded to test catechu in this connection, as tincture of catechu never gelatinizes. An ample proportion of catechu was employed, which, in all probability, is far in excess of actual need. The success of this process is complete, as no change occurs in tincture of kino so prepared, after keeping it for upwards of eight months exposed to the air with impunity. That the catechu is really protective, and not merely so by appearance, for reason of using an unchangeable kino, is shown by the fact that the same kino, used alone, gives an impermanent tincture. Another remarkable circumstance is that a tincture of kino, already quite syrupy from oxidation, when treated with one-third its volume of the catechu-kino tincture, ceases to thicken and remains intact on unlimited exposure thereafter. It is evident that the catechu is not the preserving agent, as a tincture made by using an aqueous extraction of the catechu is equally effective. The writer recommends the following process for preparing a permanent tincture of kino:

Kino	One and a half troy ounces.
Catechu	Half a troy ounce.
Alcohol	Four fluid ounces.
Water sufficient to make one pint.	

Powder the kino and catechu, mix them, add ten fluid ounces of water, heat for ten or fifteen minutes with constant stirring, and let the mixture cool. Now add water to the measure of twelve fluid ounces and then add the alcohol. Pour the mixture into a bottle containing sixty grains of filter paper, shake the whole well at intervals and strain the tincture through fabric after twenty-four hours.

PARAFFIN AS AN EXCIPIENT FOR DEOXIDIZABLE SUBSTANCES.

By Geo. Smith, F.C.S.

In a former paper published in this Journal (Am. Jour. Phar., 1884, p. 436), an account was given of some estimation of permanganate of potassium, which had been made into pills containing 2 grains each of the salt with 3 grains of an excipient composed of vaseline 2 parts, paraffin wax 1 part, and kaolin 3 parts. These pills were coated with a solution of sandarac resin in absolute alcohol and had been kept a little over seventeen months before estimation. The results then obtained by treating them and their resinous coating with distilled water till all permanganate was removed, and estimating with a standardized solution of oxalic acid, gave a reduction equal to 70 per cent., but on carefully scraping off the sandarac coating a reduction equal only to about 47 per cent. was observed. The presence of the organic coating alone was thus proved to have exercised a reducing influence equal to 23 per cent. It was, therefore, considered desirable to pursue the investigation further on a pill-mass *per se* made according to the above formula. The best white vaseline and washed kaolin were used in preparing the excipient. The mass was made September 28, 1884, and examined July 6, 1885, consequently it had been kept a little over nine months (two hundred and eighty-one days). The oxalic acid method was again adopted in the estimation of the permanganate, but the solution used differed from the former one in the mode of its titration. This was done by dissolving 6·3 gm. of dry oxalic acid in a litre of distilled water, and ascertaining the exact permanganate value of each c.c. by titration with an aqueous litre solution containing 3·14 gm. of a sample of the salt ($K_2Mn_2O_8$) from which the pills were made. A mean of three carefully conducted estimations made on 10, 20 and 30 c.c., gave an average value of ·00332 gm. $K_2Mn_2O_8$ for each c.c. of oxalic acid solution. The pill-mass used in the estimation weighed 7·74 gm. This, according to the formula, originally contained two-fifths of its weight of potassium permanganate, therefore, the salt theoretically present weighed 3·096 gm. The mass was carefully rubbed down in a clean glass mortar with distilled water at the ordinary laboratory temperature, and the solution filtered through glass wool into a litre flask till the washings were colorless. It was then diluted to 1000 c.c. with distilled water, and three estimations of the unreduced permanganate were made as follows:

(*a*) 30 c.c. required 21·8 c.c. oxalic sol. to complete decolorization.
(*b*) 50 c.c. " 36·25 c.c. " " "
(*c*) 50 c.c. " 36·3 c.c. " " "
130 c.c. " 94·35 c.c. " " "

Then $\frac{130\times3\cdot096}{1000}$ = ·40248 gm. ($K_2Mn_2O_8$) calculated, and 94·35 × ·00332 = ·313242 gm. ($K_2Mn_2O_8$) found, equivalent to 77·82 per cent.

This pill-mass was only kept about half the time the former had been, but the results (while not strictly comparable) show that if the pills are freshly dispensed with a minimum quantity of excipient, and not coated with a reducing medium, Martindale's mixture practically answers its purpose.

Estimation of unreduced salt in a pill-mass containing chloride of gold and sodium (sodium chlor-aurate).—The gold salts employed were obtained from a firm well known as manufacturers of fine and rare chemicals, but it was considered desirable for the purpose of the following investigations to ascertain beforehand the exact percentages of metal and chlorine contained in each. For this purpose a small quantity of the contents of the 15 grain tubes was weighed off for the estimation of gold and chlorine, whilst the remainders were also weighed off at the same time (to avoid deliquescence), and worked up into pill-masses. All the gold estimations were made by reduction with oxalic acid in slight excess, whilst the chlorine in the filtrate from the precipitated metal was estimated gravimetrically by precipitation with $AgNO_3$ in presence of a large excess of HNO_3 in order to prevent any argentic oxalate from precipitating with the chloride. It was noticed in shaking out the salt ($NaAuCl_4.2H_2O$) that the crystals seemed moist, and the somewhat low percentages found may perhaps be accounted for by this fact. ·420 gm. of sodium chlor-aurate was taken. This gave ·200 gold and ·13892 chlorine. The following are the percentages found with those calculated for $NaAuCl_4.2H_2O$:—[1]

Calculated.		Found.
Na =	5·8	
Au =	49·47	47·619
Cl_4 =	35·67	33·076
$2(H_2O)$ =	9·06	
	100·00	

[1] Au = 196·2, Ag = 107·66, Na = 22·995, O = 15·96, N = 14·01, Cl = 35·37, H = 1. 'Die Atomgewichte der Elemente.' (Meyer and Seubert.)

In making the pill-mass, the question of doses (1-30th to 1-10th of a grain, U.S.P.) had to be considered in framing a working formula which would approximately represent what would actually occur in the pharmacy if a prescription containing the remedy were required to be dispensed. The following formulæ were adopted :—

(*Hypothetical Prescription.*)

℞ Auri et sodii chloridi .....gr. $\frac{1}{15}$.
Excipientis (Martindale).....q. s.
Fiat pilula secundum artem. Mitte, 30.

(*Working Formula.*)

Chloride of gold and sodium .....1 part.
Paraffin wax.....2 parts.
White vaseline.....4 parts.
Washed kaolin.....6 parts.

The wax and vaseline were melted together, and the gold salt rubbed down with the kaolin till it was thoroughly divided, then the whole was beaten up into a pill-mass with the requisite quantity of wax and vaseline mixture. One part of salt is contained in every 13 of mass, and to dispense the above prescription, 26 grains of mass would be required for the thirty pills ordered, thus making each pill weigh just under 1 grain. The pill-mass was made May 22, 1885, according to the above working formula, and estimated November 18, 1885, consequently it had been kept nearly six months (one hundred and eighty days). 7·83 gm. were weighed off for estimation, equalling ·6023 of incorporated gold salt. The mass was carefully rubbed down with distilled water at the ordinary laboratory temperature, and the resulting solution filtered through a long column of moist asbestos, which had previously been washed with HNO_3 and distilled water till free from any traces of chlorine. By this means all the finely suspended kaolin was removed and the clear solution made fit for gravimetric estimation. The *débris* of the pill-mass (kaolin, vaseline, etc.), together with the asbestos filter, were washed with distilled water till chlorine ceased to be detected in the liquid which passed through. The filtrate was evaporated to a low bulk, and ½ gm. of oxalic acid dissolved in a little distilled water added. After standing a few days, the precipitated metallic gold was collected on a quantitative filter, washed, dried and incinerated. It weighed (less ash) ·105 gm. This is equivalent to ·2205 gm. of the sample of $NaAuCl_4 2H_2O$ used, or 36·6 per cent. of the gold salt, which was originally incorporated in the mass. A reduction equal to 63·4 per

cent. had therefore taken place. Owing to an accident to the filtrate the chlorine was not estimated.

Estimation of unreduced salt in a pill-mass containing acid chloride of gold (hydrogen chlor-aurate).—In the gold and chlorine estimation, ·3605 gm. of salt was used. The *modus operandi* in this case was similar to the preceding estimation of the sodium chlor-aurate, and a total yield of ·174 gm. metallic gold and ·503 gm. argentic chloride was obtained. The percentage results calculated for $HAuCl_4.4H_2O$ agree well with theory:—

Calculated.		Found.
H =	·24	
Au =	47·8	48·266
Cl =	34·46	34·5
$4(H_2O)$ =	17·5	
	100·00	

In making the pill-mass, the following formulæ were used, having regard to the probable dose (1-30th to 1-20th of a grain):—

(Hypothetical Prescription.)

℞ Auri perchloridi (acidi).....gr. $\frac{1}{20}$.
Excipientis (Martindale).....q. s.
Fiat pilula secundum artem. Mitte 20.

(Working Formula.)

Acid chloride of gold.....1 part.
Paraffin wax.....3 parts.
White vaseline.....6 parts.
Washed kaolin.....9 parts.

The mode of mixing was the same as in the preceding case. One part of salt is contained in 19 of mass, so that 19 grains of the latter would make twenty pills, containing 1-20th of a grain in each. The mass itself was made June 3, 1885, and estimated January 13, 1886. It had been kept, therefore, about seven and a half months (two hundred and twenty-four days). 7·6015 gm. of mass were taken for analysis, equivalent to ·4 gm. of the salt ($HAuCl_4.4H_2O$). The treatment was similar to that of the preceding sodium chlor-aurate pill-mass, and the total weights of precipitated metallic gold and silver chloride obtained were ·0305 gm. and ·2715 gm. respectively. The gold found (·0305 gm.) is only equivalent to ·0638 gm. ($HAuCl_4 4H_2O$) or 15·95 per cent. of that actually incorporated in the mass. The reduction (84 per cent.) is considerably more than was expected from the appearance of the mass before estimation. The silver chloride found (·2715 gm.) is equivalent to ·06713 gm. of

chlorine, or 48·68 per cent. of that incorporated in the mass as hydrogen chlor-aurate. These results prove the presence of a considerable amount of free hydrochloric acid in the mass, as the amount of chlorine dissolved out as gold salt ($HAuCl_4 4H_2O$), and therefore part of the total 48·68 per cent. found, is only equal to ·021993 gm. or 15·94 per cent. of the total originally combined with the excipient as hydrogen chlor-aurate. Whether the 15·32 per cent. of chlorine which remains unaccounted for, had combined to form additive or substitution products with the olefins probably contained in the mixed paraffins, or whether it was altogether dissipated, has not yet been ascertained. The mode of its disappearance, while not essential to the purpose of the preceding inquiry, yet remains of some interest from a chemical point of view.

The conclusions to be drawn from the investigations mentioned in this paper, and those published July 12, 1884, are that Martindale's mass may be pronounced perfect as an excipient for silver salts, of which argentic nitrate may be cited as a type.[1] Practically, it can also be said to answer its purposes for permanganate of potassium, particularly if the pills are recently dispensed with a minimum quantity of excipient. That it appears to fail somewhat conspicuously in the unstable chlorine compounds of gold is probably due to the relatively large quantities of the excipient used, viz.: 12 parts of excipient to 1 of sodium chlor-aurate, and 18 to 1 of hydrogen chlor-aurate. With a little dispensing ingenuity the total quantity required could be considerably decreased, thus probably increasing the available percentage of unreduced salt in the pills, which should always be made up only as required for use. Those who can recall to memory the unsatisfactory methods of dispensing the unstable compounds mentioned in this paper before Mr. Martindale suggested the excipient which now bears his name, will readily admit that the thanks of all dispensers and therapeutists who have to deal with them are due to that gentleman for his scientific foresight and generosity in advocating and publishing formulæ for general use on the dispensing counter. The excipient is not yet perfect, however, but the dispenser may not have long to wait before the difficulty which is at present experienced in purifying the commercial paraffin compounds from a series of lower homologues will be overcome.—*Phar. Jour. and Trans.*, May 15, p. 957–958.

[1] See *Pharmaceutical Journal* for July 12, 1884, p. 21. Am. Jour. Phar. 1884, p. 437

GLEANINGS FROM FOREIGN JOURNALS.

By George H. Ochse, Ph.G.

To Distinguish Oleomargarin from Butter J. Horstler recommends the following procedure: A piece of oleomargarin the size of a hazelnut is placed in an epouvrette and the end made air-tight. Into another epouvrette a like quantity of butter is treated in the same way. When both epouvrettes are held in the hand the oleomargarin soon liquefies, forming a clear solution, whilst butter requires double the time for solution, and when dissolved is not so clear as the oleomargarin solution. When the tube is filled one-third full with ether the oleomargarin is easily dissolved and does not produce any turbidity or precipitate on the addition of alcohol. Butter when treated in like manner yields a precipitate.—*Pharm. Rundschau*, xii, p. 225.

Tyrotoxicon, a ptomaine extracted from poisonous Cheese.—Vaughan has isolated a ptomaine from poisonous cheese by treating the cheese with water; the aqueous solution is acidulated and a slight excess of caustic soda added, agitated with ether and the ethereal solution allowed to evaporate spontaneously; the residue is again treated with water and shaken with ether, and the ethereal solution evaporated in presence of sulphuric acid, when acicular crystals are formed. Tyrotoxicon, when placed on the tongue, produces an acrid and burning sensation, soon followed by dryness of the throat and nausea. The smallest quantity, when absorbed, produces diarrhœa. It reduces iodic acid, but is not precipitated by the ordinary reagents for alkaloids; water, alcohol and ether dissolve it. When exposed to the air it loses its crystalline form, an acid product remaining.—*Journal de Pharm. et de Chimie*, 1886, 409.

Selenium Iodide.—Guyot prepares selenium iodide by adding an excess of selenium to a solution of iodine in carbon bisulphide. The filtered solution, when evaporated spontaneously, deposits beautiful gray-black crystals having a metallic aspect. These crystals consist of protiodide of selenium (Se 23·83, I 76·16). Iodide of selenium may also be prepared by heating selenium with an excess of iodine in a sealed tube by means of a water-bath. The temperature of the water-bath is sufficient to keep it liquid; on cooling it solidifies. Exposed to the air the excess of iodine is liberated, leaving the selenium protiodide as residue. If, however, the operation is conducted in a sealed and bent tube, at a higher temperature, fine black, needle-

shaped crystals of selenium biniodide are formed. Protiodide of selenium is decomposed by heat, is very soluble in carbon disulphide, forming a blood-red solution, and in chloroform. When boiled with water it is decomposed, yielding hydriodic and selenic acids, which soon liberate free iodine. Caustic alkalies and their carbonates decompose selenium iodide. It colors the skin yellow and is capable of dissolving a large quantity of iodine.—*Répertoire de Pharmacie*, 1886, p. 182.

Hypodermic Pearls.—To preserve solutions for hypodermic use some propose to dissolve the medicament in an aromatic distilled water; others propose the addition of alcohol, glycerin, salicylic acid, etc.; these additions change or modify the action of the medicament simply dissolved in water. The preparation of solutions from pellets or gelatin discs, when wanted for use, yields solutions which are neither clear nor limpid; to filter them is almost impossible, since the greater part of the liquid would be taken up by the filter. Limousin proposes to use glass pearls having a capacity of slightly more than 1 c.c., ovoid in shape and having the one end terminating in a narrow tube. The interior of the pearls is sterilized according to Pasteur's method, by submitting it to a temperature of about 200° C. The pearls are then filled and the ends sealed with an oxyhydrogen lamp. Thus kept the solutions are not affected by atmospheric influence. A solution of Bonjean's ergotin was preserved for more than a year; hydrochlorate of morphine was also preserved, becoming slightly darkened when exposed to the light. During very cold weather, should any crystals separate they can be redissolved by simply warming in a flame. The solutions should be prepared from boiling water which has been previously filtered. Limousin rarely employs distilled water for making the solutions, experience having proven that, owing to the lack of saline matter which water ordinarily contains, it is more prone to become mouldy.—*Bull. Gén. de Thérap.*, April, 1886, p. 316.

Phosphorus Pentafluoride.—Thorpe prepared pentafluoride of phosphorus by the action of trifluoride of arsenic on pentachloride of phosphorus, but was unable to free the gas from arsenic trichloride and arsenic trifluoride, nor did he succeed in liquefying it. M. H. Moissau has since obtained it in a pure state by the action of bromine on trifluoride of phosphorus ($5\ PFl_3+5\ Br_2=3\ PFl_5+2\ PBr_5$). With Cailletet's apparatus, temperature 16° C., and a pressure of 16 atmos-

pheres, Moissau succeeded in condensing the gas. Strange to say, when liquid pentafluoride of phosphorus does not affect glass. In the liquid state pentafluoride of phosphorus contains 75·398 per cent. of fluorine.—*Phar. Zeitung*, 1886, p. 216.

Synthesis of Coniine.—By the action of paraldehyde on *a* picoline, at a temperature of about 250° C., Ladenburg obtained an oil, sparingly soluble in water, and boiling at 190–195° C., which, by reduction, yielded a base having the same composition as coniine ($C_8H_{17}N$), also possessing the same odor and solubility in water, and the boiling point =166–170° C. The hydrochlorate fuses at 203° C. The double salt formed with iodide of cadmium ($[C_8H_{17}NHI]_2CdI_2$) is similar to the characteristic double salt formed with coniine. Lange's *a* picoline is obtained from pyridine, and pyridine can be obtained in several ways by synthesis, hence an accurate synthesis is wanting.—*Chem. Zeitung*, x, p. 63.

Solution of Caoutchouc.—According to Beiersdorf, gum elastic can be dissolved in ether by the addition of a small quantity of oleic acid. The resulting solution, when applied to the skin, is more elastic and more agreeable than collodion.—*Phar. Centralhalle*, 1886, p. 221.

VARIOUS BLEACHING LIQUIDS.

By G. Lunge and L. Landolt.

Chlorozon.—This substance, manufactured by passing chlorine mixed with air into caustic soda, and for which a high value as a bleaching agent has been claimed, is actually a solution of hypochlorous acid in sodium chloride, with traces of free chlorine and of sodium chlorate. Chlorous acid and chlorine peroxide are absent. Comparative experiments showed that the omission of the air-stream has no effect on its composition.

Products of the Action of Chlorine on Magnesia.—Dry or nearly dry magnesium hydroxide does not yield a bleaching powder when treated with chlorine. When chlorine is passed into a milk of magnesia at 15°, or even at 0°, more than half of the absorbed gas goes to form chlorate (with the corresponding chloride), the remainder producing hypochlorite. At higher temperatures, or on warming

the above solutions, or even passing air through them, almost all the hypochlorite is converted into chlorate, a small portion decomposing into chloride and free oxygen. Neither chlorate nor free oxygen (except traces) is formed when chloride of lime is mixed with sulphate of magnesia.

Action of Chlorine on Zinc Hydroxide.—With the solid hydroxide only a trace of a bleaching compound is formed. With the hydroxide suspended in water, both hypochlorite and chlorate are formed, the latter in smaller proportion than in the case of magnesia. Heating converts the hypochlorite partly into chlorate, but the tendency to decompose into chloride and free oxygen is greater than with magnesia hypochlorite.

The solution obtained by mixing a zinc salt with chloride of lime is less stable than the corresponding magnesian solution.

Aluminous Bleaching Liquids.—Aluminium hydroxide does not absorb chlorine. The solution obtained by double decomposition contains chiefly hypochlorite, but part of this immediately splits up into aluminium hydroxide and free hypochlorous acid.

Alteration on keeping.—Chloride of lime, and the solutions containing magnesium, zinc, and aluminium obtained from it by double decomposition, change very slowly in the dark, but on exposure to diffused daylight in closed vessels rapidly lose nearly the whole of their bleaching power.

Conversion of Chloride of Lime into Chlorate.—Simple boiling is insufficient; the formation of chlorate progresses very slowly, and more than half of the hypochlorite decomposes into chloride and oxygen. If, however, the liquor is saturated with free chlorine, 70 per cent. is at once converted into chlorate (with the corresponding chloride) in the cold, and although without heat the further progress of the change is very slow, yet on heating to boiling it is completed without loss of oxygen. Passage of chlorine during the heating is prejudicial.

Comparative bleaching experiments with the bleaching compounds of the above four metals shows that the zinc solution acts the most rapidly. The passage of carbonic anhydride for a short time, or the addition of a minute quantity of acetic or oxalic acid, accelerates the action immensely. When used in excess, the three acids seem to be about equally active.—*Jour. Chem. Soc.*, 1886, p. 399.—*Chem. Ind.*, 1885, p. 337.

RELATIONS OF THE PHOSPHATES IN URINE.

By A. Ott.

The acid reaction of urine is now known to be due to an excess of acid over normal phosphates. The author gives a series of analyses showing the relative quantities of phosphoric acid present in the urine combined in the form of acid and normal phosphates. Huppert's method of analysis was used. The urine was collected daily at 10 P.M., 8 A.M., and 2 P.M. Meals were taken after each collection of urine; dinner and supper consisting of meat and vegetables, breakfast of coffee and bread. The average of the analyses shows that the ratio of P_2O_5 combined as normal phosphate to that combined as acid phosphate was as follows: Evening urine (2 P.M. to 10 P.M.) as 91 : 100, night urine (10 P.M. to 8 A.M.) 56 : 100; Morning urine (8 A.M. to 2 P.M.) 58 : 100; or, for the total urine for 24 hours as 69 : 100.

The large amount of normal phosphates present in the evening's urine illustrates the previously known fact of the relation between the food taken and the phosphates in the urine.

Erlenmeyer (*Ber.*, ix., 1839) has shown that acid calcium phosphate is soluble in 700 parts of water. But that the urine is able to hold more than this in solution is accounted for by the presence of other salts in it, for it is known that if acid calcium phosphate and calcium chloride be mixed in equivalent quantities, a solution can be obtained in which the phosphate is dissolved in only 34·2 parts of water. Similarly it is shown that the normal phosphate is more soluble in urine than in water, salts such as potassium phosphate and sodium chloride aiding its solution.

By heating the aqueous solution of both phosphates, they are precipitated, the acid phosphate being changed into the normal phosphate, whilst phosphoric acid passes into solution. But in normal urine no such precipitate, or only a very slight one, occurs. This is accounted for again by the presence of other salts, especially magnesium phosphate, potassium phosphate, and sodium phosphate. This can be shown experimentally with the individual salts, and normal urine contains such proportions of these salts as to prevent precipitation by heat.—*Jour. Chem. Soc.*, 1886, p. 167.—*Zeitsch. Physiol. Chem.*, x., 1–10.

THE SOLUBILITY OF CARBONATE OF LITHIUM IN WATER CONTAINING CARBONIC ACID.

By A. Goldammer.

It is known that the carbonates of the alkaline earths, though nearly insoluble in water, are soluble to a considerable degree in water containing carbonic acid, and that in this respect lithium resembles them in behavior. Lithium, it is true, is soluble in water, and I have obtained results corresponding with Bewad's statement that one part is soluble in 75 parts of water at 15° C.; but, its solubility is considerably increased by the introduction of carbonic acid. This behavior of lithium carbonate has found only slight mention in technical literature, but it presents some interest in respect to the alleged existence of a solid bicarbonate of lithium.

In an experiment in which I suspended 75 gm. of finely powdered lithium carbonate in a litre of water and passed a current of carbonic acid through it during three days 5·41 per cent. by weight of lithium carbonate went into solution. When atmospheric pressure was used the solution was effected much more rapidly. In experiments where a pressure of four atmospheres was used during six hours, in one case 6·40 per cent. and in another 6·87 per cent. of lithium carbonate was dissolved. It is assumed that under greater pressure, continued during a longer time, the carbonic acid would have effected the solution of still more lithium; but from the solution prepared under the above-mentioned pressure the lithium carbonate separated out in a crystalline form immediately after filtration, whilst a solution prepared without pressure remained unaltered during several days, and, under proper conditions, a longer time.

It would be of advantage to the mineral water manufacturer if a solution of the bicarbonate of lithium could be kept unaltered; it would present many conveniences, seeing the difficult solubility of the monocarbonate. This, according to my experience, however, is only possible by maintaining the solution under pressure in a manner analogous to a solution of magnesium bicarbonate. A solution containing 5 per cent. of lithium monocarbonate will, it is true, remain unaltered for a long time, in bottles filled to the cork; but, after the removal of a part of the contents of the bottle, as well as after several openings of the cork, and especially upon a rise of temperature, a considerable quantity of lithium carbonate crystallizes out. If a

flask containing a solution be heated in a water-bath, at about 50° C., evolution of gas begins and separation of lithium carbonate. The solution shows itself more resistent to the introduction of atmospheric air; it requires a strong current to be passed through it for a considerable time before the lithium carbonate commences to separate.

Although a freshly prepared and filtered solution of bicarbonate of lithium gave, in a quantitative determination of the carbonic acid, an amount which fell only slightly below the quantity calculated for $LiHCO_3$, an older, freshly-filtered solution, from which lithium carbonate had already separated, never gave the amount of carbonic acid required for that formula. The carbonic acid found, which agreed closely in several experiments, indicated such a quantity of simple carbonate as corresponded closely to the proportional solubility of the latter.

I. A freshly prepared (filtered) solution, containing in 100 parts 12·63 parts of $LiHCO_3$, yielded 7·95 of CO_2; calculated, 8·17.

II. An old (filtered) solution, containing in 100 parts 8·53 parts of $LiHCO_3$, yielded 4·87 of CO_2; calculated, 5.52.

A freshly prepared solution of bicarbonate of lithium gives with mercuric chloride solution a strong white turbidity, which remains unaltered for a minute; whilst in a (freshly filtered) solution from which lithium carbonate has already separated, the turbidity caused by the addition of mercuric chloride is not pure white at first, and, after a few seconds, passes into a red precipitate.

From a solution of bicarbonate of lithium it is always the monocarbonate that crystallizes out, and I have not succeeded in separating bicarbonate or a sesquicarbonate. I think it necessary, considering the numerous erroneous statements to emphasize this. In very slow evaporation (in an exsiccator or standing in the air) a dense verrucose crystalline crust forms on the surface of the liquid, which, under the microscope, is seen to consist of groups of small, irregular crystals, that decrepitate when heated. In a rapid evaporation upon a water-bath there is formed, on the contrary, partially, a crystalline powder, refracting light strongly, which, under the microscope, is seen to consist of well-formed prismatic crystals, that do not decrepitate when heated. Upon covering a concentrated solution of lithium bicarbonate with a layer of alcohol there was at once a lively evolution of carbonic acid and amorphous lithium carbonate was thrown down.

After these fruitless attempts to obtain lithium bicarbonate in a dry condition, it is surprising that, nevertheless, a "lithium bicarbonicum" figures in commerce. I have purchased a sample of this commercial lithium bicarbonicum from one of our best houses and examined it. It proved to be not a bicarbonate, but a crystallized monocarbonate, corresponding exactly with that which I obtained by evaporating a solution of lithium bicarbonate in a water-bath. There no more exists a lithium bicarbonate or sesquicarbonate in the dry condition than magnesium or calcium bicarbonate.

It is probably not superfluous to remark that, in my experiments, I observed that lithium carbonate, upon being heated to redness in a glass tube or porcelain dish, very readily attacked the glass or porcelain, carbonic acid being given off. I have determined a loss of as much as 6 per cent., while so much silicic acid entered into combination with the lithium that, after dissolving the residue in dilute hydrochloric acid, the liquid became gelatinous. According to Flückiger, lithium carbonate also gives off carbonic acid on prolonged boiling with water.—*Phar. Jour. and Trans.*, May 15, p. 964.—*Phar. Centralhalle, April* 1.

INVESTIGATION OF TANNINS.

By F. Nötzli.

After some introductory remarks on the preparation and chemical constitution of the tannic acid of oak-bark, the author gives an outline of the different methods proposed for estimating the tannin in barks and other tannin materials. He then discusses at some length the methods recommended by Löwenthal, Simand, and Procter, and as an outcome of his researches, describes a modified method for estimating tannins. The process involves the use of (1) a permanganate solution containing 1 gm. of potassium permanganate per litre, standardized with iron or oxalic acid; (2) a solution of indigo prepared by dissolving 125 gms. of indigo-carmine paste in 6 litres of water, adding 400 c.c. of concentrated sulphuric acid, and filtering the mixture; (3) a gelatin solution, 20 gms. per litre, to be prepared every day, as it decomposes very rapidly; (4) dilute sulphuric acid, 1 kilo. per 10 kilos. of water; (5) pure sodium chloride; and (6) kaolin. To effect the titration, 10 c.c. of extract of bark (or 5 c.c. in case of rich barks) is transferred to a large porcelain basin and treated

with 20 c.c. of indigo solution and 1 litre of water. The permanganate solution is then added gradually (about three drops in two seconds), the mixture being stirred continually. The end of the reaction is ascertained by the change of color from light green to pure yellow. At this stage the edge of the basin exhibits a reddish tinge, the appearance of which indicates the completion of the oxidation. To analyze barks, the author proceeds as follows: 10 gms. of the bark previously dried at 100 are boiled out repeatedly with water until iron paper ceases to give a reaction indicative of tannin. The infusion is then made up with water to 1 litre, and a portion filtered through a dry filter-paper; 5 or 10 c.c. of the filtrate is now titrated with permanganate. 50 c.c. of the filtered extract is precipitated with gelatin, salt, and kaolin, and 10 or 20 c.c. of the filtrate titrated. The permanganate values obtained are calculated into percentage of tannin contained in the bark according to Neubauer's equivalent, 63 oxalic acid = 41·57 tannin.—*Jour. Chem. Soc.*, 1886, p. 496.—*Dingl. Polyt. Jour.*, cclix.

ACTION OF SULPHURIC ACID ON OLEIC ACID.

By A. Sabaneieff.

The author has investigated the product of the action of sulphuric acid on oleic acid, employed as a mordant under the name of "alizarin oil." The oleic acid used in the experiments was prepared from oil of sweet almonds, and thoroughly purified; it solidified at 6° to a white, crystalline mass, melting at 14°; in the liquid state, it was perfectly translucent and free from any taste or smell.

Oleic acid cooled down to at least 6°, when it becomes crystalline, was treated with sulphuric acid; the reaction under these conditions is not violent, and the temperature does not rise considerably, although the products of the reaction are the same as when oleic acid is used in the liquid state. An evolution of sulphurous anhydride is rarely observed. The reddish-brown product of the reaction, when treated with water, separates into two layers, of which one consists of aqueous sulphuric acid only; the other (which on neutralization with alkali gives the so-called alzarin oil) was dissolved in ether, and subsequently treated with water, in which a portion only is soluble.

The portion insoluble in water consists partly of a solid substance,

partly of a liquid; the former being more sparingly soluble in ether was freed from the latter by washing with this solvent. This solid substance evidently consists of a fatty acid; it melts after repeated crystallization at 79°; the analytical data point to its being hydroxystearic acid, a view confirmed by determinations of the degree of saturation of the compound by means of Hübl's method (described in 1884), the hydroxystearic acid was converted into iodostearic acid (identical with Saytzeff's compound, described in 1885,) and into stearic acid. The melting point of hydroxystearic acid, as determined by the author, differs somewhat from the data of former investigators (varying from 56° to 85·5°).

The liquid substance, after repeated washing with alcohol, gives a liquid residue which seems to be the anhydride of hydroxystearic acid; it is also obtained by heating the acid at 130–150°. It does not combine with bases, is sparingly soluble in alcohol, and is converted into the acid by boiling with alkalis; an attempt to convert the anhydride into the corresponding amide failed. The substance extracted by alcohol from the liquid portion contains in addition to a certain quantity of this anhydride and of hydroxystearic acid, an unsaturated liquid fatty acid, which seems to be unaltered oleic acid.

The portion of the product soluble in water was found to consist of sulphohydroxystearic acid, as proved by analysis of its copper salt, and by determination of its degree of saturation by Hübl's method. This sulphonic acid is easily decomposed, especially by heating it on the water-bath with hydrochloric acid, into hydroxystearic and sulphuric acids. Its aqueous solution always retains a certain amount of oleic and hydroxystearic acids and the anhydride of the latter.

On the whole, the experiments show that the duration of the reaction between oleic and sulphuric acid does not influence the quantity of sulphonic acid formed, 20 per cent. of the oleic acid being obtained as a rule in the form of this compound: 7·5–15 per cent. remain unchanged, and 70 per cent. is converted into hydroxystearic acid and its anhydride. These data, as well as the non-formation of sulphurous anhydride, do not agree with the explanations of this reaction, proposed by former investigators (Müller-Jacobs, Liechti and Suida, Lukianoff); the author considers it most probable that the action of sulphuric acid on oleic acid consists of a series of simul-

taneous processes, partly yielding compounds of the two acids, not decomposed by water and dissolving therein, partly giving substances decomposed by water, which converts them into the insoluble substances described in the present paper.—*Jour. Chem. Soc.*, 1886, p. 442.—*J. Russ. Chem. Soc.*, 1886.

ON THE ESSENTIAL OIL OF LIME LEAVES (CITRUS LIMETTA). Preliminary Notice.

By Francis Watts, F.C.S.,
Chemist to the Montserrat Company, Montserrat, W. I.

The leaves and young shoots of the lime tree yield a fragrant yellow oil by distillation with water or in a current of steam. About 230 c.c. were prepared for the purpose of the present investigation.

The oil is moderately soluble in rectified spirit of wine, and has a sp. gr. = 0·8777 at 33° (water at 4° = 1). When agitated with soda solution, no appreciable diminution of volume was observed.

The oil was submitted to fractional distillation, and the several fractions were agitated with a strong solution of sodium bisulphite. It began to distil at about 170°, and the portion which passed over at this temperature did not combine with the bisulphite. It consisted of a hydrocarbon. On the other hand, the fraction obtained at 220–230° formed a crystalline mass with the bisulphite. But as this fraction had no action, or but very slight action, on silver nitrate, it was inferred that it consisted of a ketone, rather than an aldehyde.

About one-third of the original oil boils at a temperature above 280°, has a viscid consistence, and exhibits a green fluorescence. It has, in fact, the appearance of colophene, and may possibly have been produced, at least in part, by the action of heat in the course of distillation.

From the lowest fractions, after digesting with sodium, a hydrocarbon was separated, boiling at 176–177°, inactive to polarized light, and having a refractive index at 30° of 1·4611 for red light. This compound unites with hydrogen chloride, forming a hydrochloride which melts at 49–50° in an atmosphere of hydrogen chloride. It also gives Riban's color reaction with ferric chloride. Except with regard to its action on polarized light, this hydrocarbon resembles the citrenes.

From the action of sodium on the lower fractions of the original

oil, and the production of a deep purple coloration when hydrogen chloride is passed into them, the presence of terpinol is rendered very probable. It was not found possible to isolate it.

In order to determine the constitution of the ketone already referred to, it was oxidized by means of chromic mixture. Abundance of acetic acid was produced, and pelargonic acid was recognized by means of its copper salt. These facts, coupled with the boiling point (220–230°) of the compound, and the peculiar smell of pelargonium oil noticeable in some of the fractions, prove that the substance is methyl nonyl ketone, $CH_3 \cdot CO \cdot C_9H_{19}$.

The watery alkaline solution resulting from the first washing of the original oil was found to contain acetic acid, and the liquid submitted to distillation smelt strongly of amylic acetate. The quantity of this compound was, however, too small to admit of its separation.

From these results, it would appear that the principal constituents of the oil of lime leaves are, a citrene (b. p. 176° *circa*), terpinol ($C_{10}H_{17} \cdot OH$), methyl nonyl ketone, and a colophene.—*Jour. Chem. Soc.*, 1886, p. 316.

MORPHINE LACTATE.

By D. B. Dott.

This salt crystallizes from its aqueous solution in four-sided prisms, in this respect resembling all the other morphine salts which I have examined. A quantity of the crystallized lactate was dried on blotting paper and exposed to the air for three days, by which time it appeared to be dry. The air-dry salt was analyzed as follows:—

(1.) 15·245 grs. exposed in water-bath lost 0·10 gr. = 0·655 per cent. This loss in weight is manifestly due to adhering moisture. On transferring the salt to an air-bath kept at a temperature of 110° C., the weight decreased very slowly, the substance darkening in color at the same time. Even after several hours the weight had not become constant, and the loss amounted to only a fraction of a per cent. The dried salt, on being now treated with water, left undissolved a considerable portion of dark amorphous matter, showing that decomposition had taken place, to which the loss in weight was undoubtedly due.

(2.) 29·02 grs. of the air-dry salt were dissolved in about half an ounce of warm water, and ammonia added in slight excess. After

eighteen hours the precipitate was collected on a filter, washed with cold water, dried under 100° C., and weighed in clasped watch glasses. Weight of precipitate = 23·13 grs. = 79·70 per cent. The theoretical yield of morphine hydrate from anhydrous morphine lactate is 80·80. This difference of about 1 per cent. is just what one would expect on account of the loss in mother-waters and washings. We may therefore affirm from these results that morphine lactate as crystallized from water, has the composition $C_{17}H_{19}NO_3$, $C_3H_6O_3$. So far as I am aware, this is the only salt of morphine which crystallizes from water as an anhydrate. It may here be noted that the dose of the lactate is the same as that of the muriate.

The solubility in water and in alcohol was next determined. Portions of the salt were digested in these menstrua at a temperature slightly under 60° F. for four hours, then for half an hour at 60° F. with frequent agitation. The filtered solutions were then weighed, evaporated to dryness, and the residues taken as the quantity dissolved.

(*a*) Solubility in water.

$$\frac{100{\cdot}70 - 11{\cdot}255}{11{\cdot}255} = 7{\cdot}94$$

One part morphine lactate is soluble in 8 parts water at 60° F.

(*b*) Solubility in 85 per cent. alcohol.

$$\frac{111{\cdot}98 - 1{\cdot}20}{1{\cdot}20} = 92{\cdot}31$$

One part morphine lactate is soluble in 93 parts rectified spirit at 60° F.

I have to thank Messrs. J. F. Macfarlan & Co. for kindly permitting me to publish this note.—*Abbey Hill Chemical Works, Edinburgh.—Phar. Jour. and Trans.*, May 15, p. 958.

DERIVATIVES OF PAPAVERINE.

By G. Goldschmiedt.

Papaveraldine, $C_{20}H_{19}NO_5$, is obtained by gradually adding a 2 per cent. solution of potassium permanganate to 25 gms. of papaverine, previously treated with sufficient sulphuric acid to form an acid salt and dissolved in 1 litre of water. The quantity of permanganate required is about 50 gms. The precipitate is washed with water and extracted with alcohol several times. The yield is over 50 per cent. of the theoretical. It forms a yellowish crystalline powder, which melts at 210°, is insoluble in water, readily soluble

in glacial acetic acid and in moderately dilute mineral acids; the best solvent is chloroform. When treated with concentrated sulphuric acid, it acquires a yellowish-red color, which becomes dark violet when the solution is warmed. The *hydrochloride*, with $2\frac{1}{2}$ mols. H_2O, forms long, lustrous, slender, yellow crystals; the *acid sulphate* crystallizes in long, slender, lemon-yellow needles. Both salts are decomposed by water. The *plantinochloride*, with 1 mol. H_2O, forms small, lustrous, orange-colored prisms. The *phenylhydrazine-compound* crystallizes from dilute alcohol in small reddish aggregates; it melts at 80–81°.

Dimethoxycinchoninic acid, $C_{12}H_{11}NO_4 + 2H_2O$, is formed in small quantities in the preparation of papaveraldine, and is best obtained by oxidizing 10 gms. of papaverine with a 5 per cent. solution of 50 gms. of potassium permanganate. It forms yellowish needles, which melt at 200–205° with effervescence, and is readily soluble in alcohol and hot water. The *ammonium salt* is readily soluble. The *hydrochloride* forms yellow, slender, lustrous needles; the *plantinochloride* crystallizes in groups of needles. An estimation of methoxyl-groups by Zeisel's method showed that the acid contains two such groups. When boiled with hydriodic acid, and the product steam-distilled with zinc-dust, quinoline is obtained.

In the oxidation of papaverine to papaveraldine, small quantities of the following are formed besides dimethoxycinchonic acid: *a*-pyridinetetracarboxylic, veratric, hemipinic, and oxalic acids, and (?) meconin.

Papaveroline, $C_{16}H_{13}NO_4$, is prepared by boiling papaverine with an excess of hydriodic acid. About half of the hydriodic acid is then distilled off, and the residue on cooling deposits crystals of the hydriodide of the new base. This crystallizes from water in almost colorless small needles with 2 mols. H_2O. The free base is obtained by decomposing the hydriodide with sodium carbonate solution under a layer of ether, taking care to avoid an excess of carbonate. It forms white crystals which soon become dark when exposed to air.

When papaverine is fused with potash in a closed retort, dimethylhomopyrocatechol and methylamine distil over, whilst the residue is found to contain 3:4 dihydroxybenzoic acid, and a small quantity of oxalic acid.

The *phenylhydrazine-compound* of papaveric acid, $C_{22}H_{21}N_3O_6$, crystallizes in bright yellow needles, melting at 190°.

The results of the experiments described in this and the preceding papers of the author point to the following constitution for papaverine:—

$C_9NH_4(OMe)_2 \cdot C_6H_2Me(OMe)_2$ [Me : OMe : OMe = 2 : 5 : 6].

The author hopes soon to be able to determine the positions of the two methoxyl-groups in the quinoline nucleus.—*Jour. Chem. Soc.*, 1886, p. 478.—*Monatsh. Chem.*, vi., 954.

POLYGONUM HYDROPIPER.[1]

In the last number of this Journal, we notice a paper on the active principle of this drug, by C. J. Rademaker, M. D., in which he severely criticizes an analysis made by us, and published in this Journal January, 1885. We cannot resist calling attention to the following statement:

1st. In 1871, Dr. Rademaker claimed to have discovered the active principle of Polygonum Hydropiper (see this JOURNAL) by a process which, as we showed, would certainly yield tannic acid, or a mixture of tannic and gallic acids. This part of our paper he in no way questions.

2d. He now offers, in place of the process published in 1871, a very different method. Whether or not this new process will yield the so-called polygonic acid, we do not care at present to say, except to call attention to the fact that the only evidence offered is a drawing of the crystals, as they appear under a microscope, showing 700 diameters.

3d. It is almost unnecessary to remind the readers of this Journal, that it is very poor chemistry to judge of the unknown constituents of a plant by its physiological action, or by the appearance of an ether residue under the microscope.

4th. No evidence is offered of the "imperfect manipulation" of which he accuses us; and we *did not say* (as he quoted us) that our drug was collected by *an expert* botanist.

6th. If Dr. Rademaker will send 10 grams of the so-called polygonic acid, *prepared by the process published* in 1871, to the editor of this Journal for presentation at one of the pharmaceutical meetings, together with a full account of the method of manufacture, we have no doubt that body will appoint some one to verify it. This would be a rapid and satisfactory way of ending the discussion. Until then, we see no reason for recalling a single statement made by us.

7th. We do *not* say that the process offered in his last paper will not produce a new acid, although we confess we believe it doubtful, and ask for more evidence than physiological action and microscopic crystals.

HENRY TRIMBLE.

PHILADELPHIA and SAN ANTONIA, TEXAS, June, 1886. HERMAN J. SCHUCHARD.

A New Caustic made of benzol and calomel, has proved useful in epithelioma. The pain is said to be slight and brief.—*N. E. Med. Monthly*, May, 1886.

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[1] This paper came to hand just as we were going to press—too late to have it inserted among the original articles.—EDITOR AMER. JOUR. PHAR.

VARIETIES.

LARGE DOSES OF STRYCHNINE have been given by Dr. Lardier (*Jour. Méd. Chir. prat.*) in the treatment of delirium tremens. In one case ·005 gm. (gr. $\frac{1}{12}$) of strychnine, given every two hours for several days, produced little or no effect; but, on increasing the dose, and using the alkaloid also hypodermically, until 0·10 gm. (gr. 1½) had been given in twenty-four hours, refreshing sleep was produced without any symptoms of strychnine poisoning.

SCOPOLEINE AS A MYDRIATIC.—Pierd'Houy describes the alkaloid of *Scopolia japonica*, and claims for it a stronger mydriatic action than is obtainable from atropine. Clinically the use of the drug was found to be exempt from the discomforts observed in the exhibition of atropine. Its action is described as being very rapid, and, therefore, adapted to cases in which an immediate ophthalmoscopic examination is desirable.—*Les Nour. Remèdes*, Feb. 1, 1886; *Med. News*, April 3.

HYDROBROMATE OF CONIINE.—The variations in the quality of curare, and the consequent difficulty of adjusting the dose, have led Schulz and Peiper (*Arch. f. exp. Pathol. u. Pharm.*, xx.) to experiment with hydrobromate of coniine as a substitute in the treatment of tetanus, rabies, and the like. Thus far, they have tried it only on animals tetanized with brucine, and they find that, whether given before or after the brucine, it has a decided effect in mitigating the convulsions, and especially that it relieves the breathing.—*N. Y. Med. Jour.*, May 1, 1886.

TABLETS OF NITRO-GLYCERIN.—Among the errors of the last British Pharmacopœia, the ordering of nitro-glycerin to be dispensed in chocolate tablets is perhaps the worst. Not only is the dosage uncertain, and the manipulation required dangerous, but this method of administration is slower in action and exceedingly expensive; in fact, it is difficult to conceive why the compilers should have gone out of their way to choose so inconvenient and impracticable a vehicle, when the one per cent. solution of the drug, which has been in general use for a considerable period, was open to them. It is stable, easily gauged, of prompt action, and has, in fact, all the merits which are conspicuous by their absence in the present formula. The tablets in question are not stamped, and bear no indication of their nature and strength, and mistakes which might be dangerous in their results may easily occur.—*Med. Press.*

AMERICAN PHARMACEUTICAL ASSOCIATION.

The Thirty-Fourth Annual Meeting will convene in the city of Providence, R. I., on the first Tuesday, the 7th of September, 1886, at 3 o'clock, P.M. All local Associations of Pharmacists are entitled to accredit five delegates, and should send the credentials to the Permanent Secretary—John M. Maisch—at least two weeks in advance of the meeting. Delegations from Colleges of Pharmacy and State Pharmaceutical Associations, may appoint one of their number to serve on the Nominating Committee; considerable time would be saved if these appointments were communicated to the Permanent Secretary, during the morning preceding the first session.

Applications for membership, accompanied by the fees, should be sent as

early as possible to the Chairman of the Committee on Membership—Geo. W. Kennedy, Pottsville, Pa.

It is confidently expected that arrangements will be perfected so as to afford ample time for the reading and discussion of papers, and all members are urged to forward their essays as early as possible to the Chairman of the Committee on Papers and Queries—Prof. J. U. Lloyd, Cincinnati.

Attention is also directed to the *Centennial Fund*, the interest of which is to be used for defraying the expenses of suitable investigations (see Chapter VII of By-Laws of the Council). Members desiring to avail themselves of this fund will please make application to one of the members of the committee, which consists of the President, Joseph Roberts, Baltimore, Md.; the Chairman of the Finance Committee, S. A. D. Sheppard, Boston, Mass.; and the Permanent Secretary, J. M. Maisch, Philadelphia, Pa.

The Committee on Arrangements, of which the Local Secretary, Mr. Wm. B. Blanding, is chairman, is endeavoring to provide for the accommodation and comfort of members and visitors, while traveling to, and during their stay at the place of meeting. Further particulars will be announced in a circular from the Permanent Secretary.

JOSEPH ROBERTS, *President.*

BALTIMORE, June 15, 1886.

PHARMACEUTICAL COLLEGES AND ASSOCIATIONS.

Alabama Pharmaceutical Association.—The annual meeting was held at Birmingham, May 11, and the next meeting will be held in Mobile, on the second Wednesday of May, 1887. A. L. Stollenwerck, Birmingham, was elected President; P. C. Candidus, Secretary, and W. F. Punch, Local Secretary.

The East Tennessee Pharmaceutical Association, which was organized last year, met in Knoxville, May 11th, and after transacting the business before it, adjourned to meet in 1887, on the second Tuesday of October, at Cleveland. Its officers are: G. Albers, Knoxville, President; M. Block, Chattanooga, and E. W. Tedford, Maryville, Vice-Presidents, and J. G. Rawlings, Chattanooga, Secretary and Treasurer.

The Illinois Pharmaceutical Association held its seventh meeting in Rockford, June 8th to 10th, President Patterson in the chair. Besides the President's address, and the reports of the officers and committees and of the Pharmacy Board, a number of papers were read, among them one on "The Value of Botany to Pharmacists," by Prof. Bastin; "Pressed Herbs," by C. B. Allaire; "Preservation of Alkaloidal Solutions," by Prof. Stuart; "Products of Orange Culture, and Medicated Waters," by L. C. Hogan. The new officers are: President, B. F. Gardner, Atlanta; Vice-Presidents, F. A. Druehl, Chicago; A. Shumway, Lanark, and J. S. Green, Morrison; Treasurer, G. H. Sohrbeck, Moline; Secretary, L. C. Hogan, Englewood. The next meeting will be held in Decatur, the date to be fixed by the Executive Committee.

The Indiana Pharmaceutical Association held its fifth meeting at Lafayette, June 8th and 9th. Besides the usual addresses and official reports, a number of papers were read, various questions of local and general interest were discussed, and a visit was made to the Purdue University, more especially to the Department of Pharmacy. The officers elected are: President, Leo Eliel, South Bend; Vice-Presidents, Dav. Hilt, Lafayette; N. Jay, Stockwell,

and G. H. Loesch, Indianapolis; Treasurer, J. N. Hurty, and Secretary, F. Hereth, both of Indianapolis. Richmond is the place of the next meeting.

Kansas Pharmaceutical Association.—The seventh meeting took place at Emporia, June 9th and 10th. The President, officers and committees presented their reports, and Prof. L. E. Sayre reported on the progress made in the department of Pharmacy, which was opened in the State University last fall. The liquor question, in its relation to and influence upon Kansas pharmacy, was the theme of several papers and much discussion. Papers were read by Prof. O. A. Wall, on "Apprentices;" by Prof. Sayre, on "Scale Pepsins," and by R. J. Brown, on "Kansas Plants." Prof. Sayre was elected an honorary member. The officers for the present year are: President, W. C. Sears, Burlington; Vice-Presidents, R. S. Drake, Beloit, and M. S. Griffin, Nortonville; Secretary, J. T. Moore, Lawrence; Assistant Secretary, D. Holmes, Topeka, and Treasurer, C. D. Barnes, Abilene. Next meeting at Wichita, on the first Wednesday of June, 1887.

The Maryland Pharmaceutical Association held its fourth annual meeting in the chamber of delegates, capitol building in Annapolis, June 1st. A steamer had been chartered, which conveyed most of the members, many of them accompanied by ladies, to the place of meeting after a pleasant sail from Baltimore. President Dr. E. Eareckson presided. The president's address, and the reports of officers and committees were read and discussed; that on trade interests dealing largely with the question of the liberal coinage of silver. The Committee on Legislation explained the difficulty encountered in securing the passage of a State pharmacy law, and it was then resolved that the draft of such a law be communicated to every pharmacist in the State, at least two months before the next annual meeting, so as to have it freely and intelligently discussed next year, before again submitting it to the legislature. The membership of the Association embraces about one-fourth of the druggists of Maryland; a number of new members were admitted, and Messrs. Charles. A. Heinitsh and J. M. Maisch were elected honorary members. Several papers were read by titles, and referred to the Executive Committee, and Prof. Simon gave a very interesting outline of his paper on the aims and objects of modern chemistry. Greetings were exchanged with several State Associations then in session, and delegations were appointed to the meetings of the pharmaceutical associations of adjoining States. A circular from the National Retail Druggists' Association was read, and after discussion, it was resolved that the appointment of a delegation was inexpedient. Mr. J. J. Thomsen urged the desirability of the abolishment by the United States of the *tax on alcohol* when used for manufacturing purposes, and submitted and explained a plan by which he thought the object could be accomplished. The Association approved these outlines and ordered the matter to be submitted to Congress, and to be communicated to other pharmaceutical associations. Mr. A. J. Corning, of Baltimore, was elected president, and M. L. Byers, of Hagerstown, was re-elected secretary. After the transaction of other routine business, and after passing the customary votes of thanks, an adjournment was had to Ocean City, where the next meeting will be held on the third Tuesday (19th day) of July, 1887.

After visiting the various places of historical interest and the Government institutions, the company again embarked on the steamer, which conveyed

them a considerable distance down the Chesapeake Bay, dinner and supper being served aboard. With speeches, music, singing and other entertainments, the hours passed rapidly, and late in the evening the company parted in Baltimore.

Massachusetts Pharmaceutical Association.—At the fifth annual meeting held in Boston, June 1–3, President Pease in the chair, an address of welcome by the Mayor, the President's address, and the reports of officers and committees were first made, and an appropriation, not to exceed $50, was voted in furtherance of the plan proposed for the reorganization of the National Retail Druggists' Association. Among the papers read was one by Prof. Markoe on the reaction between potassium bromide, chloral hydrate and alcohol; S. A. D. Sheppard, on business methods; J. W. Colcord, pharmaceutical education; Prof. Pengra, on new remedies; F. A. Davidson, on kaolin; H. Canning, on toilet articles; J. W. Colcord, on an improved percolator; W. C. Durkee, on calcium carbonate, and W. W. Bartlet, on milk analysis. The present officers are: H. Canning, Boston, president; J. H. Manning, Pittsfield, G. E. Fairbanks, Worcester, and W. E. Luscomb, Salem, vice-presidents; J. W. Colcord, Lynn, secretary, and F. H. Butler, Lowell, treasurer. Holyoke was selected as the place for the next meeting, which will be held on the first Tuesday of June, 1887.

Missouri Pharmaceutical Association.—The eighth annual meeting was held at Sweet Springs, June 15 and 16. President A. T. Fleischmann in the chair. The president's address dealt with various questions of importance to pharmacists, which were further considered by a special committee and subsequently acted upon by the Association. The reports of the various officers showed a cash balance on hand of $196.64, and a total membership of nearly 700, including the newly elected members. A circular from the National Retail Druggists' Association was read and referred to a committee, which recommended the appointment of a delegation to this body, and to the American Pharmaceutical Association, the report being adopted. Greetings by telegraph were exchanged with several State associations.

The following papers were read: On trade interests, by J. Richardson; on pharmaceutical legislation, by Prof. Good, and on the commercial traveler, by D. Y. Wheeler. A number of papers were also presented by Prof. Curtman, chairman of the Committee on Queries, and mostly read by title.

The amusements provided consisted of concerts and various races and tournaments.

The officers elected for the ensuing year are: A. H. Caffee, of Carthage, president; C. E. Corcoran, of Kansas City, B. O. Wood, of Monroe City, and D. Y. Wheeler, of Sedalia, vice-presidents; J. M. Good, treasurer, and G. H. C. Klie, secretary. The next meeting will again be held at Sweet Springs, on the third Tuesday of June, 1887, and it is contemplated to extend the sessions over three days. L. Kuntz, of Brownsville, is local secretary.

Nebraska Pharmaceutical Association.—The annual meeting was held at Omaha, May 11. The business transacted consisted in the reception and discussion of the reports of officers and committees, and the consideration of a proposed pharmacy law. Prof. O. A. Wall read a paper on pharmaceutical nomenclature. The next meeting will again convene at Omaha, on the second Wednesday of May, 1887. Jas. H. Reed is president; C. J. Daubach, secretary, and N. A.

Kuhn, local secretary.

New Jersey Pharmaceutical Association.—The sixteenth annual meeting took place at Newark, May 19. Several papers were read, the titles of which have not been received. Mr. J. B. Kilmer, of New Brunswick, was elected president; the treasurer, recording secretary and corresponding secretary were re-elected. Next meeting at Paterson, on the third Wednesday of May, 1887.

New York Pharmaceutical Association.—President Macmahan presided at the eighth meeting held at Rochester, June 8-10. An address of welcome by the Mayor, the president's address, and reports of officers and committees, occupied the greater part of three sessions. An appropriation not exceeding $50, was made with the view of reorganizing the National Retail Druggists' Association; and the official recognition of exhibits at the time of the meeting, was abolished. The papers read were of interest and importance, and were quite numerous. The officers elected are: C. Z. Otis, Binghamton, president; J. H. Smith, Au Sable Forks, J. Thomas, Buffalo, and R. E. Phillips, Fulton, vice-presidents; secretary and treasurer were re-elected. The next meeting will be held at the Thousand Islands Park, the date to be announced by the executive committee. R. E. Phillips, Fulton, is local secretary.

Pennsylvania Pharmaceutical Association.—The ninth annual meeting convened in the court house at Lebanon, at 2 o'clock P.M., on Tuesday, June 8th, and after holding six sessions, adjourned on Thursday. President George presided, and Dr. J. A. Miller, the secretary, was at his post. The various officers and committees presented their reports. A very elaborate report on *unofficinal formulas* was read by the chairman, C. T. George, of Harrisburg, presenting numerous formulas more or less in use, and many of them offered in the place of defective formulas of the New York and Brooklyn Formulary. The report was ordered to be communicated to the Committee of the American Pharmaceutical Association, also to be published in advance of the proceedings, in the "Pharmaceutische Rundschau" of New York. The report on *adulterations and sophistications* created considerable discussion, mainly on the sale of *oil of betula lenta* in the place of *oil of gaultheria*, the position being taken that the former should not be sold for the latter, although the two were in the main, chemically identical; the relation between these two volatile oils being similar to those of staranise and anise, and of Chinese cinnamon and Ceylon cinnamon.

The report of the Committee on Apprentices, made by the chairman Wm. B. Thompson, commented favorably on the action of the Philadelphia College of Pharmacy, which had adopted a plan matured by Wallace Procter, involving the appointment of a special committee for the purpose of examining, free of charge, young men contemplating to become apprentices of pharmacy, with the view of determining their fitness for such a course from their general education and knowledge.

The report on *pharmaceutical legislation* embraced the draft of a State pharmacy law, which had been communicated to all druggists in the State, and was now considered, somewhat amended and referred to a committee for presentation to the legislature.

A circular communication from the National Retail Druggists' Association was read and ordered to be placed on file.

A resolution was passed declaring the distribution in the meeting room of

pamphlets and trade circulars to be of questionable propriety, and prohibiting it in the future.

The following papers were read:

On Membership, a paper by M. N. Kline, showed the advantages resulting from organizations; and another by L. Emanuel, advocated the consideration of scientific questions and of commercial topics, and urged the adoption of formulas for household medicines.

The Practical Value of a Knowledge of Botany was discussed by L. Cisin. In illustration of this subject, Prof. Maisch referred to the fact that in Lebanon and some of the adjacent counties of Pennsylvania, a limited quantity of absolutely *pure saffron* was annually produced, while even the best quality of imported saffron contained admixtures of styles, stamens and corolla shreds in small proportion, and much of the saffron of commerce was grossly adulterated.

Goods on Commission was the subject of a paper by J. W. Miller. The writer expressed himself in opposition to this practice, and quoted from *Purdon's Digest* (page 652), showing that such goods may be sold for storage or any other charge after giving notice to the owners and advertising the contemplated sale.

Another paper by Mr. Miller, entitled *Neglect*, discussed the efforts made for elevating pharmacy, and the appreciation of such efforts by the public.

Apprentices, by D. Phreaner. This paper treated of the educational deficiencies of many pharmaceutical apprentices.

Mutual Fire and Life Insurance of Druggists, by J. F. Patton. The mutual feature does not commend itself, because the uncertainty and variability of the premiums, payable through the year, robs the mutual plan of that element of security and certainty which the object of insurance is designed to foster.

The Compounding by Country Physicians was the theme of a paper by J. W. Ridpath, giving some advice to village apothecaries in their intercourse with physicians.

Explosives and Explosive Mixtures, by C. D. Lippincott.

Weights and Measures, by W. L. Turner. To prepare the way for a more perfect understanding of the decimal system, and to make the several denominations readily interchangeable with the American weights, a revision of the latter is proposed, so as to make the grain the fifteenth part of the metric gram; the ounce to weigh 500 new grains, and the pound 14 new ounces, which would make the kilo equal to 30 new ounces. For the word gram the designation *weight* might be adopted. This change would make 1 weight (1 gram) = 15 grains; 1 deciweight (0·1 gm.) = $1\frac{1}{2}$ grain; 1 centiweight (0·01 gm.) = $\frac{3}{20}$ grain, and one milliweight (0·001 gm.) = $\frac{3}{200}$ grain. The relation of the present standards with the proposed new one, is shown in the following table:

1 avoird. pound	=	$453\frac{1}{2}$	weights (or gm.)	=	7000	old grains	=	6804 new grains.
1 new "	=	$466\frac{2}{3}$	" "	=	$7201\frac{1}{2}$	"	=	7000 "
1 Troy ounce	=	$31\frac{1}{10}$	" "	=	480	"	=	$466\frac{1}{2}$ "
1 new "	=	$33\frac{1}{3}$	" "	=	514	"	=	500 "

For measures of capacity the metric system might well be adopted, and if deemed desirable, the terms *litre*, etc., might be readily replaced by others of corresponding import.

Indigenous Drugs.—Geo. W. Stoeckel gave a list of drugs collected in Penn-

sylvania; the list is arranged in groups of adjacent counties, but quantities could be obtained only in few instances. Besides such staple articles, like tobacco, hops and paraffin, the following were reported as being sold in largest quantities: ginseng, burdock, elecampane, cimicifuga, mullein, kalmia, hepatica, stramonium, spearmint, peppermint, marjoram, flaxseed, wax, and the oils of gaultheria, sweet birch and sassafras.

Drugs and Preparations in little demand.—Prof. S. H. Stevens has collected statistics from 235 pharmacists doing business in 36 counties in Pennsylvania, from which it appears that there is little demand for 610 out of the 997 drugs and preparations of the pharmacopœia, namely: For 11 abstracts, 3 vinegars, 9 acids, 4 waters, 4 cerates, 2 papers, 2 confections, 2 collodions, 2 decoctions, 12 plasters, 78 extracts and fluid extracts, 4 infusions, 5 liniments, 5 lithium salts, 8 mixtures, 4 mucilages, 2 oleates, 6 oleoresins, 18 oils, 5 pills, 8 potassium compounds, 12 sodium salts, 3 spirits, 15 syrups, 27 tinctures, 74 troches, 13 ointments, and 4 wines, the remainder being vegetable and animal drugs.

Commercial Tartaric and Citric Acids.—Prof. Trimble examined six commercial samples of tartaric acid, which contained between 99·45 and 99·90 per cent. of $H_2C_4H_4O_6$, ·08 and ·29 of moisture, and ·009 and ·40 per cent. of ash. Only one of the samples gave indications of slight traces of lead; sulphuric acid was absent from two, present as traces in three, and present in somewhat larger proportion in one sample. (See also Am. Jour. Phar., 1885, p. 228). The three samples of citric acid examined were free from other organic acids, contained traces of sulphate and of lead, and yielded between ·065 and ·084 per cent. of ash; the percentage of $H_3C_6H_5O_7, H_2O$ was 99·82, 99·96 and 101·92, the last sample having somewhat effloresced.

Annatto.—G. W. Kennedy examined 8 commercial samples, in which the moisture varied between 18·75 and 55·0 per cent., and the amount of ash between 5 and 28 per cent. A colorimetric test was made with the dried samples in alcoholic tinctures of 1 : 1000; taking the darkest colored tincture as the standard, 100, the others ranged 70, 60, 50, 50, 20, 20, 10.

Honey.—J. W. Ridpath has made numerous unsuccessful experiments with the view of preventing the crystallization of honey without making any addition; remelting at a low temperature, and keeping the liquefied honey in a moderately warm place is recommended, and a little glycerin may be added. Further experiments will be made.

The Purity of Beeswax.—J. L. Lochman reviewed the tests for detecting resins, fats, fatty acids, paraffin, water, amylaceous and mineral substances.

Oil of Camphor, by C. A. Heinitsh. During the past sixteen months 94,500 lbs. of this oil were imported into the United States; but it was impossible to ascertain in what manner it is consumed. The oil is, to a limited extent, employed in medicine, and is said to be used in the manufacture of celluloid, varnishes, paints, lampblack, and of low-priced toilet soaps; it is also stated to be employed for adulterating volatile oils, such as sassafras, cajuput, cubeb, cassia, anise, gaultheria, rhodium, peppermint, etc. No reliable tests are known for detecting such adulterations.

Petrolatum.—J. B. Duble compared three commercial specimens of soft paraffin with two more expensive ones sold under trade names, and ascertained the former to compare favorably with the latter. The pharmacopœial tests appear

to be reliable and ready methods for detecting the presence of resinous, bituminous and other organic matters.

Camphor Cerate, by C. A. Heinitsh.—Ointments and cerates, containing from 10 to 30 per cent. of camphor, are prescribed in many sections of our country, and may be used as substitutes for the so-called *camphor ice*. The pharmacopœial camphor cerate is too weak a preparation, and, having been admitted mainly for the extemporaneous preparation of *Goulard's cerate*, may well be dropped; the use of the latter being now almost obsolete.

Oleates in Officinal Ointments, by C. T. George.—Ointments, prepared according to the pharmacopœia, were treated with benzin, the filtrate evaporated, the residue dissolved in a hot mixture of chloroform 1 vol. and alcohol 3 vol., the solution placed on ice to separate stearin, and the filtrate evaporated and tested for the metals, the presence of which was shown in the case of the ointments of zinc oxide, mercury, mercuric oxide and mercuric nitrate. The amount of oleate formed was shown approximately from the amount remaining undissolved in benzin; for 240 grains of ointment the loss was for mercurial ointment, 40 grains; ointment of red mercuric oxide, 8 grains, and ointment of yellow mercuric oxide, 10 grains. Ointments of nutgall treated with benzin or oil of turpentine showed in the solution the presence of tannic and gallic acids, if made with lard, and the absence of these compounds in the solution from ointment made with petrolatum.

Concentrated Nitrous Ether, by Profe-sor L. E. Sayre.—Attention is called to the rapid decrease of ethyl nitrite in the officinal spirit under ordinary exposure, and it is suggested that the spirit be prepared in small quantities from the concentrated ether, kept in sealed vials in a dark and cool place. Two samples of commercial concentrated nitrous ether showed the presence of 89 and 90 per cent. of crude ether.

The Yield of Extract of Nux Vomica.—Prof. Maisch corrects a statement incorrectly reported in the discussion last year. From 2200 lbs. of nux vomica, percolating with alcohol sp. gr., .835, the yield of extract was almost exactly 10 per cent., but varied in some experiments between 8.1 and 11.3 per cent. These results agree well with those of Conroy and Lyons, reported by Dr. A. B. Lyons in a paper read before the Michigan Pharmaceutical Association in 1885. Weaker alcohol yields a larger amount of extract, and infusion with hot water gives from 18 to 22 per cent. By maceration with alcohol, a much smaller amount of extract of nux vomica is obtained, as is shown by the statements of French and German authors. In preparing the tincture of nux vomica, U. S. P., the alcoholic strength of the mentruum used for exhausting the drug must be scrupulously adhered to.

Messrs. Joseph Roberts, of Baltimore, and Fred. Hoffmann, of New York, were elected honorary members.

The officers for the current year are Jas. A. Meyers, of Columbia, president; Wm. L. Turner, of Philadelphia, and J. Harris, of Hamburg, vice-presidents. Messrs. J. L. Lemberger and J. A. Miller were re-elected treasurer and secretary, and Wm. B. Thompson, of Philadelphia, was elected assistant secretary. The next meeting will be held in Philadelphia on the second Tuesday of June, 1887.

By invitation, the members and guests paid a visit to one of the furnaces of the Cornwall Iron Works, and witnessed several castings of pig iron. Visits

were also made in a body to the Miller Organ Factory and to the grounds of the Lebanon Brewing Company; and after the final adjournment, an excursion was made by rail to the famous Cornwall iron mountain, and to the picnic grounds at Mount Gretna and Lake Conewago, where—an unlooked-for thunderstorm notwithstanding—a very agreeable afternoon was spent.

The Ohio Pharmaceutical Association convened at Springfield, June 2–4. President Melville in the chair; and opened with an address of welcome by the Mayor. The address of the president, the reports of other officers and committees, and a report of the State Board of Pharmacy, were read and disposed of; and a number of papers, practical and scientific, were read, for which two prizes were awarded. The officers elected are: president, Prof. V. Coblentz, Springfield; vice-presidents, C. N. Nye, Canton, and W. D. Fulton, Bucyrus; secretary and treasurer were re-elected. Next meeting at Akron, on the second Wednesday of June, 1887.

Texas Pharmaceutical Association.—At the meeting held at Dallas, April 27th, G. H. Rice, of Baudera, was elected President, W. L. Tucker, Waco, Secretary, and E. W. Lancaster, Marshall, Treasurer. The next meeting will be held at Fort Worth, on the second Tuesday of May, 1887.

West Virginia Pharmaceutical Association.—The annual meeting, announced for June 8th, was not held, for want of a quorum.

EDITORIAL DEPARTMENT.

Theoretical Science in the Pharmacopœia.—The critical paper on "Official Pharmacy," by Mr. Rother, which is published in the present number, treats of "a new feature of a rather questionable nature," which was introduced in the last edition of the "U. S. Pharmacopœia." When it is remembered that the object of a pharmacopœia is to define the character, establish the purity and regulate the strength of medicines, its position as a law book becomes at once apparent. This character is, in the main, well preserved in our Pharmacopœia, as far as the galenical preparations and chemicals are concerned, and even the addition of formulas to the latter—though not necessary for defining the character or establishing the purity of the compounds, and which have been omitted, without detriment, from various pharmacopœias—may be defended on account of usefulness in assisting to explain tests of identity and purity. But the Pharmacopœia wisely abstains from entering upon theoretical grounds, and hence alcohol is not defined to be hydroxyl-ethane or methyl-carbonol, nor is glycerin called propenyl-alcohol, or defined to be a triatomic alcohol; nor is tartaric acid designated as dioxysuccinic acid, or its relation to erythrit, malic acid, etc., indicated.

In defining animal and vegetable drugs, the Pharmacopœia has chosen a different course. Although the characters of good rhubarb have been known for a long time, it is only recently that the plant or plants yielding it became known. Obviously, a knowledge of the botanical name of a plant is not necessary for the recognition of a drug, and this is acknowledged by the Pharmacopœia in admitting, for instance, as sarsaparilla the roots of undetermined

species of Smilax. The botanical names of plants merely serve as explanations of the officinal titles and derivation of the drugs; but they add nothing to the knowledge of the drugs themselves. Authors' names after those of the plants have been omitted in the German Pharmacopœia, and they might be dropped from that of the United States without invalidating the precision of the definitions, except in those few cases in which the botanical name admitted has been applied by different authors to different plants. But we prefer this addition, mainly, on account of uniformity.

The further addition of order and sub-order is of no possible utility for the purposes of a pharmacopœia, and adds nothing whatever to the knowledge of the drug, or to the exactness of the definition; it is simply superfluous and useless. As the classification of chemical elements and compounds belongs to the science of chemistry, so does the classification of plants belong to the science of botany; and, as every chemist of note has his own system of classification differing, more or less, from others, so has every botanist of note his own system of classification, though it may be based, in its main features, upon the system elaborated by another botanist. The affinities of small and large groups of plants frequently extend in different directions, and yet they must be arranged in a lineal series. It follows from this, that the arrangement of species belonging to one genus may be accomplished in various ways, that even the limits of genera may vary in the estimation of different botanists, and, in the same manner, the limits of tribes, sub-orders and orders, as well as their serial arrangements. The natural systems actually in use are, for the reasons stated, quite numerous, although the majority of them are now based upon either De Candolle's or Endlicher's system, variously modified by considerations similar to those underlying the natural systems which were elaborated by Jussieu, Richard, Martius, Lindley, Bentham and Hooker, and many others.

The classification, perhaps, most generally followed in the United States and England, as well as in France, is that of De Candolle, and yet it is rarely, if ever, the case, that two botanists agree in all the details. Thus the genus Krameria constitutes the type of the order Krameriaceæ, while, according to others, this order is united as a sub-order to either Polygalaceæ or Leguminosæ. One botanist regards Anacardiaceæ and Burseraceæ as distinct orders; another unites the two into the order of Terebinthaceæ, and a third extends the latter so as to include Juglandaceæ, Rutaceæ, and others. In a similar manner, Aurantiaceæ and Granataceæ are found as distinct orders or attached, the former to either Rutaceæ or Guttiferæ, and the latter to either Lythraceæ or Myrtaceæ.

We think these few examples are sufficient to show that the introduction into the Pharmacopœia of natural orders means merely the admission of names which can convey a meaning only to the student of botany; and since these names are not of a fixed and unalterable, or even universally recognized temporary value, their utility is not apparent; they are even confusing in a pharmacopœia. When the student of pharmacy is compelled to make his acquaintance with botany in a systematic manner, he will then learn that there is also significance in these names, and a practical utility, which, however, points in a direction outside of the sphere of a legal code.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

American Medicinal Plants; an illustrated and descriptive guide to American plants. By C. F. Millspaugh, M.D. New York and Philadelphia: Boericke & Tafel. Fascicle IV. Price $5.00.

With the fascicle now before us two-thirds of the work has been completed. The favorable opinion expressed in regard to the portion published before, applies also to the present part, which, among its thirty plants, comprises six of foreign origin, viz.: Ranunculus bulbosus, Ailanthus glandulosus, Capsella Bursa-pastoris, Rhamnus cathartica, Genista tinctoria and Pastinaca sativa. Among the more important inaccuracies the following should be corrected: Two alkaloids have been isolated from Menispermum canadense, viz.: berberine and menispine; while investigating the latter, Mr. H. L. Barber compared its reactions with those of menispermine, which does not exist in the drug named, but is a constituent of Cocculus indicus. The alleged great resemblance of Hambright's myricinic acid (from the bark of Myrica cerifera) to myristic acid exists in the name only. Dorstenia brasiliensis is known in Brazil as *contra-herva*, and, in some localities, also as *caapeba*, which name is also used to some extent for Cissampelos Pareira, and, more generally, for Piper umbellatum.

Contributions from the Department of Pharmacy of the University of Wisconsin, No. 2. 1886. 8vo, pp. 52.

We shall endeavor to present some of the essays to our readers, either in extenso or in abstract.

Purdue University. School of Pharmacy. Bulletin No. 1. 1886. Pp. 22.

These papers were published in the May and June numbers of the present volume.

Purdue University. School of Agriculture. Bulletin No. 7. 1886. Pp. 11.

An essay on commercial fertilizers and notes on agricultural chemistry, by Prof. Rob. B. Warder.

Methods and Machinery for the application of diffusion to the extraction of sugar from sugar cane and sorghum, and for the use of lime, and carbonic and sulphurous acids in purifying the diffusion juices. By Harvey W. Wiley, Chemist. 8vo, pp. 85. With 24 plates.

Principles and Methods of Soil Analysis. By Edgar Richards, Assistant Chemist. 8vo, pp. 66.

These two pamphlets are issued by the Division of Chemistry of the Department of Agriculture at Washington.

L'Eau de Bois et les cures dépuratives au XVIe siècle. Par A. Dubouchet. Montpellier: Boehm et Fils. 1886. 8vo, pp. 42.

The water (decoction) of wood and the depurative cures of the Sixteenth Century.

Reprint from the Gazette hebdomadaire des Sciences médicales. The wood referred to is Guaiacum. The interesting essay is to a considerable extent based upon the syphilographic researches of A. Corradi, professor at the University of Pavia.

Sixty-ninth Annual Report on the State of the Asylum for the Relief of Persons Deprived of the Use of their Reason. Philadelphia. 8vo, pp. 32.

Excerpta from the biennial report of the Board of Health of the State of Louisiana to the General Assembly, 1884–85. Jos. Holt, M.D., President. New Orleans. 1886. 8vo, pp. 44.

Comparative size of metric and old units with reference to convenience. By Fred. Brooks.—Report of the Committee on Weights and Measures. 1886. 8vo, pp. 28.

These papers were read at a meeting of the Boston Society of Civil Engineers, and are republished from the Journal of the Association of Engineering Societies, May, 1886.

International Electrical Exhibition of the Franklin Institute, 1884. Reports of Examiners. Philadelphia. 1886.

Section XXIII.—Electro-medical Apparatus. Pp. 23.

Section XXVI.—Applications of electricity to artistic effects and art productions—with which is incorporated Section XXV.—Applications of electricity to musical apparatus.

OBITUARY.

Prof. Appolinaire Bouchardat died in Paris, France, April 7th, at the age of 80 years. He was born in the Department of Yonne, in 1806, embraced the pharmaceutical profession, and was for over twenty years pharmacist-in-chief, first at the Hospital St. Antoine, and subsequently at the Hotel-Dieu. In 1852 he was called to the Chair of Physics and Chemistry in the École supérieure de Pharmacie, and for 25 years was editor of the *Répertoire de Pharmacie.* He was the author of a "Formulaire Magistral," which passed through many editions; and from 1841 to 1885, published the *Annuaire de Thérapeutique, Matière Médicale, Pharmacie et Toxicologie.* Of his numerous investigations, quite a number have been republished, entire or in abstract, in this JOURNAL, during the years 1843 to 1873.

Notice of the decease of the following graduates of the Philadelphia College of Pharmacy has been received:

D. Augustus Jones, class 1869, died at Mount Holly, N. J., May 1st, of consumption, aged 38 years.

Joseph J. Karch, class 1868, died at Lebanon, Pa., May 21st, of abscess of the liver, aged 40 years. He had been in business in his native town since 1874, and at the time of his death was a member of the Lebanon School Board and of the American Pharmaceutical Association.

Stephen F. Penrose, class 1869, died at Quakertown, Pa., May 6th, of consumption, in the 40th year of his age. Since 1871 he was a member of the American Pharmaceutical Association.

Jarvis R. Wallen, class 1869, died in Philadelphia, May 24th, aged 38 years, of obstruction of bowels. He was a member of the firm of Colburn & Co., spice manufacturers, having relinquished the drug business some years ago.